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INTERNATIONAL DEGREE AND POST-DIPLOMA MOBILITY IN
INFORMATION SCIENCE

VON

VERA HILLEBRAND

INTERNATIONAL DEGREE AND POST-DIPLOMA MOBILITY IN
INFORMATION SCIENCE

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Abstract:

This study analyzed CV's of 882 authors and reviewers of the iConference to observe *degree* and *post-diploma mobility* in Information science. Half of all who were analyzed are Americans, who mostly never left their continent. On the other hand, researchers from Asia and Europe, the other half, show a high rate of mobility towards North America. These patterns match the European fear of *brain drain* – the outflow of skilled scholars to the United States. To find out what reasons are behind mobility decisions the author conducted interviews with 16 information science scholars who were born in Europe or are resident in Europe. The results of this small sample showed that personal factors like family can be a push or pull factor, meanwhile the job search in the academic sector is a push factor for international mobility. For the PhD students the financing of their doctorate is the significant factor to move. Another question this study tried to answer was if and how the professional information behavior of scholars is changing through mobility. The awareness of changes in one's own skills, when it comes to information seeking in work-related matters, is low. Mostly the researchers described the changes in their environment instead. These descriptions helped to construct a model of the "Characteristics of a research environment". Based on this model, the author concluded that *brain drain* has become a buzzword to stir up migration policy. English speaking countries are highly attractive to scholars in information science, both because English is the *lingua franca* for information science and because these research environments are often wealthier.

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1 Introduction

In 1999, the Education ministers of 29 European countries signed a declaration in Bologna to align the European Higher Education Area with the Anglo-Saxon model (Nickel, 2011). One goal of the Bologna Process was “*to facilitate student mobility and improve employability in Europe*” (Estivill et al., 2005, p. 18). Yet after eleven years working through the schedule of the Bologna Process, Nickel (2011) recognized that the goals were not reached due to insufficient time and the complex processes of change at the universities. This circumstance led to problems in attracting international students and researchers to European higher education. In 2004 (Labi), the Chronicle of Higher Education announced, “*Europeans have worried for decades about the loss of top scientific talent to the United States, and some recent studies show that the ‘brain drain’ is getting worse.*” In 2005, Laudel remarked in her study about the scientific elite that “*there is a widespread feeling that ‘whoever can go to the USA does so and tries to stay there’, we have at best only anecdotal evidence of this happening, and less to explain whether it does so across the entire spectrum of science*” (Laudel, 2005, p. 378). Laudel and Labi describe a phenomenon that is known as the *brain drain* or *brain gain*, which refers to the migration of scholars from their home to another country (OECD, 2008). This phenomenon is controversial as the quotes indicate. Brooks and Waters (2011) define *brain drain* as a concept that has been widely discredited because the most talented people within a country not so likely to move. But still, the term is used because it attracts attention in economic and political discussions about the flow of highly skilled immigrants. The discussion is controversial because the facts and data it is based on are incomprehensible. *Brain drain* implies that the flow of human capital is unilateral and long-term (Ackers/Gill, 2008). This raises the question whether this involves migration research and not just mobility? Mobility has many forms, in educational research student mobility gets separated in two forms: *credit mobility* (mobility within programs, mostly short time) and *degree mobility* (typically for the whole of an undergraduate or postgraduate degree). Due to a lack of data, *degree mobility* is understudied even though it is the form of educational mobility that leads to a permanent migration and hence to a *brain drain* more often. After graduation, mobility can play a critical role in job-seeking. This *post-diploma mobility* is observed by the Sociology of Science and by other social sciences. This research is more concerned with the *brain drain* than with international student mobility, even though today’s students may be highly skilled researchers tomorrow and their mobility patterns indicate the journey’s direction.

The dataset on which this study builds is the first of its kind: a collection of *degree-* and *post diploma mobility* data from 882 active information science scholars. The author analyzes the international mobility of students and researchers to create a bigger picture of the mobility patterns of information scholars.

To figure out the reasons for information science scholars staying or leaving, the author conducted interviews with 16 scholars and students picked from the larger sample. Due to the limitations on the length of this thesis, the interview-part of this study concentrates on European-born and European resident researchers and students. The author asked the researchers why they left, or not left their country of residence or their home country to earn a degree elsewhere or why they came to Europe to study or work. Another purpose is to find out how the information behavior of the researchers changed with their mobility. It involves analyzing human awareness about how access to information or working with other researchers influences the decision to study abroad. Do researchers and students take their patterns and information-seeking habits with them or does studying in another research environment change these patterns?

“In general, there is an ‘expectation of mobility’ in science careers between institutes or indeed countries to experience science in a different environment” (Morano-Foadi, 2005, p. 154). If it is so important for research mobility to know how to do research in a different environment, are there differences in research environments that influence outflows and inflows of (future) scholars?

Before investigating the answers to these questions in chapter 2 the author reviews the existing literature on international student mobility, international mobility of researchers and information behavior in relation to mobility. In the theoretical framework (chapter 3) the problems of data collection in mobility research are presented as well as the main research questions, using the foundation laid by Faibisoff and Ely (1974) for the investigation of academic information behavior. The three succeeding chapters are the core parts of this study. The quantitative data analysis starts in chapter 4, describing mobility patterns of researchers born in America, Europe, Asia, Middle East, Africa and Australia. Chapter 5 deals with an overview of curricular, financial, linguistic and personal push and pull factors gathered from the qualitative part of the study. In chapter 6 the author introduces her model for what makes an attractive research environment. All three parts include a discussion section, these lead to chapter 7, the conclusion, where the author re-examines answers to the research questions in the theoretical framework.

The references and the appendix with the interview guide complete this thesis.

2 Research background

Geographical mobility of students and researchers has been studied from various angles. Students are part of the higher education sector and their mobility behavior is part of the research in education. An important publication for international student mobility is International Higher Education¹ published quarterly from the Center for International Higher Education.

Gürüz (2011) faced the challenge of observing student mobility both internationally and in the global development of Higher Education over time through scholars, programs, and institutions. The collections concentrated on several host and destination countries for international students (Bhandari/Blumenthal, 2011; Kell/Vogl, 2012; Brooks/Waters, 2011), not only looking at student mobility, but also at other academic groups such as staff (Byram/Dervin, 2008). They also looked at the consequences of mobility on academics (Dervin, 2011).

The Bologna process changed the European mobility policy permanently. The quantity of literature about the consequences for the Higher Education sector in Europe is no surprise (for example: Nickel, 2011; Teichler, 2012; Westerheijden et al., 2010). Other reports describe and collect new primary and secondary quantitative data about international student mobility within Europe without making a clear distinction between *credit* and *degree mobility* (Teichler et al., 2011 and 2011a; Kelo/Teichler/Wächter, 2006). Grabher et al. (2014), on the other hand, try to point out how important the differences between these mobility types are when it comes to results. These reports are similarly structured, giving introductions to mobility in Europe (programs and definition) and then provide a geographical focus on data from individual countries. Articles often start with the geographic focus on a European country to demonstrate specific trends, characteristics and the actual state of the international student mobility (Findlay, 2011; Findlay et al., 2012; Cairns, 2015; Wiers-Jenssen, 2013). Again, in these cases, the differences between *credit* and *degree mobility* are often blurred.

Most of the literature about student mobility is quantitative in nature. Some exceptions come from social scientists who are trying to describe the international mobility of students and to investigate the social conditions for mobility (Carlson, 2013), as part of the cultural and social impact of mobility and its effect on identity of the students (van Mol, 2014; Cairns, 2010; Murphy-Lejeune, 2003). Leif Kajberg (2004) investigates international student enrollment in Library and Information Science (LIS) in a survey about the activities that foster internationalization in European iSchools.

¹ Access to online edition: <http://ejournals.bc.edu/ojs/index.php/ihe/index> (last checked: 30.03.2017)

Most studies about the mobility of scholars examine the effects of residence changes on research output (Jonkers/Tijssen, 2008; Sandström, 2009; Veugelers, 2015; Marmolejo-Leyva, 2015), by studying the interplay between productivity and mobility. Some studies also limit their analysis to a single demographic group, for example women, or only to researchers from one particular institution (Cañibano, 2008; Cañibano, 2011; Marginson, 2006), to a specific research area (Criscuolo, 2005; Furukawa, 2012; Laudel, 2005) or to an intergovernmental organization like the Organization for Economic Co-operation and Development (OECD, 2008). Ackers (2005) wrote about the relationship between highly skilled scientific migration and the transfer of knowledge within the European Union. In 2008, she published a book with Gill on the same topic. Two of the three major approaches in their report are the same as the core elements of this thesis: 1) describing mobility patterns (from Eastern Europe to Western Europe) and 2) doing interviews with researchers to detect an awareness of the social element of migration and the push and pull factors. MOBISC is another interesting study that examines the impact of unpaid work on the career path of highly-qualified men and women in employment sectors that demand a high level of international mobility.² The project report from 2005 is unfortunately unavailable, but partial results were published by different staff members. For example, Morano-Foadi (2005) explored the extent to which mobility is linked to career progression in Europe. She claims that without scholarly mobility it is impossible to construct a European Research Area. Wiers-Jenssen (2008) found out that mobile degree students more often decide to leave their country repeatedly to work internationally. However, the uneven flow between some member states is unhealthy for national research environments. In Europe, some Eastern European countries are losing young and skilled researchers to Western Europe. Baláz et al. (2004) called this a *youth brain drain* from the East to the West with little chance of return, because of the economic gap between member states. The migration of skilled researchers is called by many names, some more positive (*brain exchange*, *brain circulation* or *brain gain*), but the negative side effects for the sending countries (*brain drain* or *brain waste*) are still a concern for social research.

A concern that social science research does not seem to explore is how mobility changes the information behavior of researchers. The author found only one study concerning mobility in relation to information behavior (Kumaran/Chipanshi, 2015). Bates (1996) called the information needs and information-seeking behavior of interdisciplinary scholars and students insufficiently studied. Most studies concerning information behavior concentrate on a research

² Website of the project: <http://www.leeds.ac.uk/law/cslpe/mobisc/> (last checked: 30.03.2017)

field (Padma/Ramasamy/Sakthi, 2013; Meho/Tibbo, 2003) or have a geographic focus (Vila/Juznic/Bartol, 2012). While the results of such studies can tell how and where scholars search for research-related information, Foster (2004) and Pontis et al. (2017) investigate the information behavior of interdisciplinary scholars to develop models of information seeking.

This thesis closes several research gaps in mobility research. First, it investigates a research field that was never analyzed under the aspect of mobility using quantitative and qualitative methods. And second, it combines mobility research and information behavior research to examine the interplay between those factors and the effect of the result on the European Research Area for information scholars.

3 Theoretical framework

Mobility is a temporal form of migration, implying the possibility of more permanent migration (Wiers-Jenssen, 2013). Migration is often a sensitive issue in media, society and politics. Mobility, like migration, has its hot spots. *“The biggest single area of research on skilled migrants has focused on concerns about a ‘brain drain’ – the movement of talent from developing countries to developed nations”* (Brooks/Waters, 2011, p. 9). The expression dates back to the 1950s, when the British Royal Society feared losing scientists to the United States and Canada (Labi, 2004). Since then, these terms have remained controversial. Labi, a journalist, wrote the headline *“Europeans have worried for decades about the loss of top scientific talent to the United States, and some recent studies show that the ‘brain drain’ is getting worse.”*

In Brooks and Waters (2011, p. 9) the conclusion to the topic is *“Indeed, the premise which underpinned much concern about brain drain – that it is the most talented people within a country who are the most likely to move – has been widely discredited.”* Is the brain drain a media hype or a serious problem that researchers should stay aware of?

The uncertainty this phenomenon causes is the result of a dispute about missing data. Central points of debate are who is responsible for collecting data about mobile students and researchers, and what kind of data allows a transparent calculation. There are two types of mobility in the Higher Education Area. The *temporary mobility*, or *credit mobility*: students spent part of their time studying at another university in another country and then return to their home university to graduate. There is also *degree mobility* or *diploma mobility*: when students pursue a complete degree abroad (Kelo et al., 2006; van Mol, 2014; Grabher et al., 2014; Brooks/Waters, 2011, p. 77). Since *credit mobility* is temporary and is bound to the home university, the students plan to return. This mobility is not suitable to calculate possible migration. On the other hand, *“degree mobility implies a risk of brain drain”* (Wiers-Jenssen, 2013, p. [471]). Transnational organizations like ERAMUS in Europe determine credit mobility, which makes it easy to collect data. Such transnational organizations in the educational sector do not exist for degree mobility.

“Since the Bologna Declaration named the enhancement of student mobility as the major strategic objective of the reform program, one might have expected that efforts would have been made to establish a system of statistics and surveys suitable for monitoring the actual quantitative development of student mobility. In practice,

however, the information base for measuring trends in student mobility has remained fairly weak” (Teichler, 2012, p. 41).

The data collection for this type of mobility remains in the competence of the nation state, without guidelines or obligation. Kelo et al. (2006, p. 3) claim that on the national level governments are mostly collecting the wrong kind of data.

“They report on foreign students, using the foreign nationality of students as a measure of mobility. [...] The use of ‘nationality’ data as a measure of true mobility would not be a major problem if every foreign student (or at least the overwhelming majority) had also been mobile prior to taking up studies in the ‘host’ country.”

Only 10 out of 32 European countries are collecting data about *genuine mobility*: the numbers of students moving across national boundaries to study somewhere else (Kelo et al., 2006). The aforementioned wrong data finds its way to international produced reports by UNESCO, OECD and EUROSTAT (ibid., S. 3).

Teichler et al. (2011) debunk the myth of a *brain drain* from Europe with numbers, showing UK and Germany actually receive a higher number of European students than the United States. Welch (2008) identifies *brain drain* as a myth too, because of the influence of knowledge diasporas on the sending countries.

Just as student mobility is observed and discussed from political and economic perspectives, collecting reliable data about the relation between mobility and migration for researchers after their PhD degree is harder. There is no simple reason for mobility for researchers, because the intentions are various. Cairns (2015) suggests talks about *post-diploma mobility* for PhDs because this mobility is closer to the concept of classical migration than to international student mobility. It is a movement of longer duration and more opened-ended. Collecting data about moves is nearly impossible, because there is no comparable support environment for *post-diploma mobility* like there is for student mobility. Academic scholars and their families normally move without any organizational support (Ackers, 2005). So, the best source is the researchers themselves.

The concept this study is based on is new. It combines mobility patterns of ongoing doctoral students and researchers with those who have already finished their education. This allows to analyze two generations of researchers with a single data collection: where researchers completed their education, and, where doctoral students are completing their degree right now. As data source the author used names of registered reviewers and authors at the iConference, the annual meeting of the iSchools. The names were matched with geographical variables (detailed methodology see chapter 4.1) and gathered from online available curricula vitae

(CVs). Laudel (2003) criticized the use of CV data as a measure for mobility because there are too few CVs available through the internet. Since the author wants to describe the mobility patterns of information scholars, a bibliometric analysis, as suggested by Laudel, would be a poor solution. Analyzing CVs is the best solution available.

By deciding not just to look at papers that were accepted from the review board, the study moves away from Laudel's (2003) idea that *brain drain* relates only to the mobility of elite researchers. The author analyzes active researchers in the information science community who submit and review papers at a conference as contributing to research development.

The author concentrates the analysis on earned degrees up to the PhD level, and then only when moving to a new country. Post-doctoral phases and similar temporary stays were not included. The result of the quantitative part of the thesis should answer the following questions:

RQ 1: Are there mobility patterns for information science scholars? If yes, what are the international mobility patterns of information science scholars?

The second section of this study considers the qualitative part of mobility patterns of information science scholars (detailed methodology see chapter 5.1).

“Scientists working in different disciplines, sectors, and national contexts face very different pressures and opportunities which shape their migration decisions. Life course and career trajectories also have an important influence on the priority attached to mobility or international experience and the ability to respond to it“ (Ackers, 2005, p. 107).

If information science has common international mobility patterns, there might be common reasons for scholars to follow them. The literature studying mobility incentives or barriers over years has created what Ackers (ibid.) calls a “menu” of motivational factors shaping mobility behavior. Laura Rumbley (2011, p. 200) reviewed the existing literature on mobility obstacles and incentives and proposed three reasons for mobility: financial factors, personal factors and curriculum factors. The qualitative part should answer the second research question:

RQ 2: What are push and pull factors involving international mobility for European researchers?

The third concern of this study deals with the relation between information behavior and mobility. There are many studies, theories and models about information behavior of researchers (see chapter 2). However, in relation to mobility there is a research gap that this study wants to close.

Information behavior defines *“how people need, seek, give and use information in different contexts, including the workplace [...]”* (Pettigrew/Fidel/Bruce, 2001, p. 44). The author had two problems concerning the information behavior related interview content. First, the size of the sample was too small to generalize about information behavior for the whole of the information science community. Second, the influence of mobility on information behavior was difficult to determine just using interviews and not using experiments or other methods. By questioning interview participants about their information access, their research habits and topics, the author wanted to find out if the researchers’ behavior in information seeking is influenced by their mobility. In 1974, Faibisoff and Ely generated 14 generalizations about information needs. For these generalizations, readers should consider the audience, the circumstances where the information is used, the purpose for which it is needed and the manner in which the information is delivered. The results are based on a literature review of four groups: natural scientists, social scientists, the professions and the public. Even though the article is now old, the principles are relevant, and they can be examined as aspects of mobility. Four selected behaviors should be questioned:

[2] *“People tend to follow habitual patterns when seeking information”*
(Faibisoff/Ely, 1974, p. 46).

[4] *“face-to-face communication is a primary source of information”*
(ibid., p. 48).

For cases where participants noticed changes in information quality:

[11] *“Users of information services are often dissatisfied with quality of services and with the quality of services available to them and the assistance they receive in using these services.”*
(ibid., p. 54)

[14] *“When information needed, it must be timely, accessible and relevant”* (ibid., p. 57).

Timely, accessible and relevant: to a particular individual, at particular time, for a particular problem or interest, and in the form that is useful to him. Regardless of where it was generated or in what form or language. (ibid.)

RQ 3: Do researchers and students take their information seeking patterns and habits with them or do they change patterns in another research environment?

The evaluation of the interviews relies on Situational Analyses. This methodology grows out of Grounded Theory. The study in this thesis does not rely on ready-made concepts from existing theories, instead the author collected and analyzed open-data. Through coding underlying themes and categories were refined. The approach attempts to analyze not the individual researchers, but the situation of being moved (Ford, 2015). The goal is to demonstrate how aware researchers are about the effects of moving on their information behavior. It cannot explain individual changes in the ways researchers are searching for work-related information. But unlike other “Situational Analyses” (for ex. Anne Sen/Spring, 2013, p. 648-649) the outcome is not a map but a model, demonstrating how surroundings of the research environment limit or widen the possibilities for individual researchers in their information seeking.

While the European Higher Education Area examines student mobility, the European Union tries to implement a European Research Area (ERA) to support *post-diploma mobility*. A Commission regards mobility as a core element in research development. In 2004, the program launched the Network of Mobility Centers located in 33 countries to support both European and foreign researchers with plans to move within Europe (Morano-Foadi, 2005). “*The aim of the ERA is to create a space of free movement of knowledge, researchers, and technology in order to increase cooperation and stimulate competition. In order to achieve such an aim, obstacles to mobility need to be abolished*” (Morano-Foadi, 2005, p. 154-155). To create such a space, it is important to know the research and the research field that should work in this environment. The aim of this thesis is to contribute to the creation of an attractive European research environment for both foreign and native information scholars in order to improve this research field on the continent.

4 Mobility patterns of information science researchers

4.1 Methodology

This study uses a dataset that describes the iSchool community. It was originally collected for an analysis of the reviewing practices of the iConference, the annual meeting of the iSchools (Bogers/Greifeneder, 2016). Its attendees represent members of the iSchools around the globe coming from more than 50 LIS schools. The dataset includes all registered users from the ConfTool, the conference management system, who either submitted a contribution as an author (whether accepted or not) or was registered as reviewer in the years 2014, 2015 or 2016.

Using the data from ConfTool further information was found by manually checking each person's CV for background information. IRB approval was received both by the Faculty's IRB board as well as by the iCaucus' executive group. The final dataset contains the following information for 882 active information science scholars:

1. their gender (male or female)
2. where they currently live (country of residence)
3. if they have completed a PhD, if they have not completed a PhD, or if they are currently studying in a PhD program
4. the name of the university where they completed the PhD or where they are currently studying
5. the country where they completed their PhD
6. the country where they completed their master's degrees and
7. the country where they were born or, if this was not traceable, the country where the bachelor's degree was obtained, on the assumption that most researchers completed the Bachelor in their home country.

Laudel (2003) criticized the use of CV data as measure for mobility because there are too few CVs available through the internet. When the author started double checking names and went further to do online manual checking, it became obvious that in North America it is normal to put a CV on the university website. Data about European researchers was, however, less easy to find. Also, researchers with incomplete CV data had to be sorted out. Another problem with CV data is the language. Since the language skills of the author are naturally limited, CVs in

non-Latin characters were untraceable. Without the help of colleagues from the University of Wuhan, the number of Asian participants would be smaller, particularly data from Asian researchers who stayed at home. Uploading a CV in an international language like English seems to be related to stays in foreign countries or international visibility for research-related reasons.

One other bias of this dataset is its origin. The iConference is the annual meeting of the iSchools, an amalgamation started from mostly American schools. American iSchools are bigger than most departments from other countries. Only one of the three conferences that provided data was not held in America, but in Germany. Location influenced time and travel costs for participants not resident in North America. These facts lead to an overrepresentation of American participants.

The author will not compare the numbers of participants from one nation to another since no balanced numbers are available. In addition to investigating where European researchers went, or where they come from, and who come to Europe to work or study, the author analyzes the mobility patterns of Asian, American, Australian, Middle-East and African participants separately.

The analysis revealed results on the following three themes: 1) a mobility-index that shows how frequently researchers have moved, 2) where researchers moved to and 3) the mobility of PhD students.

The mobility-index represents the number of moves a person made before reaching their current place of residence. It goes from no-moves (index = 0) to a maximum of three moves (index > 0). The nations were summarized via the four continents (America, Europe and Asia and one last group that includes Australia, Middle East and Africa). Since the mobility of doctoral students cannot be considered as finished, as compared to researchers with doctorates, the groups were analyzed separately. The result chapter starts with a short demographical overview from all participants and then goes on with a closer look at researchers born in America, researchers born in Asia, researchers born in Europe and researchers born in Africa, Middle East and Australia. The end of the chapter has a short conclusion that leads to the qualitative part of the analysis.

4.2 Results

Of the 882 reviewers and authors, 479 are women and 403 are men. From the female participants 187 are doctoral students and 292 have a doctorate. 275 male participants have their doctoral degree and 128 are still doctoral students (Tab. 1).

| | PhD students | PhDs | total |
|--------------|--------------|------------|------------|
| female | 187 | 292 | 479 |
| male | 128 | 275 | 403 |
| total | 315 | 567 | 882 |

Tab. 1 PhD students and participants with a completed PhD degree.

As Figure 1 (N = 315) and 2 (N = 567) show most participants were born in America, followed variously by Asia and Europe, Middle East, Africa and Australia.

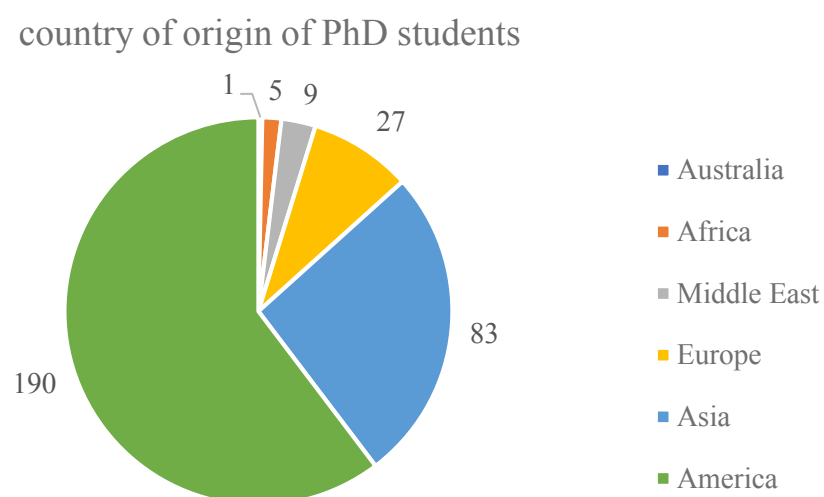


Fig. 1 Country of origin of PhD students.

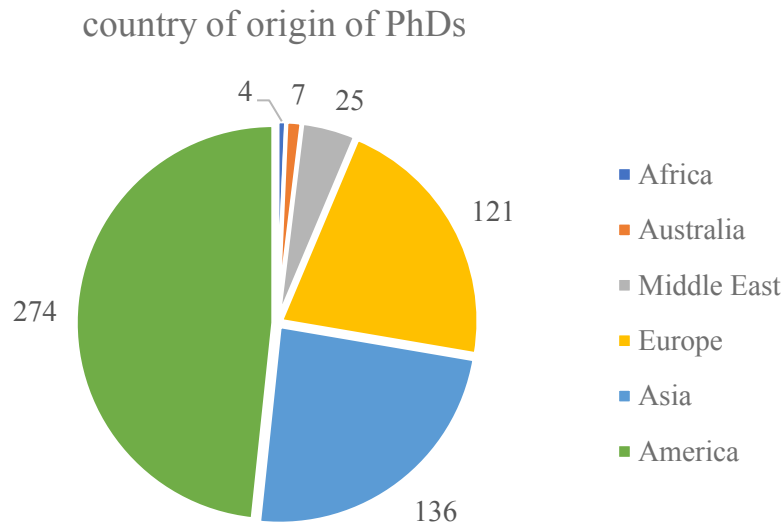


Fig. 2 Country of origin of participants with a completed PhD degree.

Since American researchers are the majority of participants their mobility patterns are discussed in detail in the next chapter.

4.2.1 Researchers born in America

America had the highest number of participants at the iConference during the last three years and thus they make up the largest subsample (57%).

| | | status | | total |
|--------------|--------|---------------|-------------|------------|
| | | PhD completed | PhD student | |
| gender | female | 144 | 120 | 264 |
| | male | 130 | 70 | 200 |
| total | | 274 | 190 | 464 |

Tab. 2 American participants separated by gender and education status.

This subsample is compounded of 264 female participants and 200 male participants, of whom 274 have a doctoral degree and 190 are doctoral students (Tab. 2). Most of them were born in the United States (395) and Canada (54). Participants from South and Middle America came next with eight from Brazil, two from Chile and each one from Honduras, Mexico, Peru, Puerto Rico and Trinidad and Tobago. Of these 15 researches, ten moved at some point to the United States or Canada.

It is remarkable that of the 464 people born in America, 400 never left their country (86.2 %). From the 64 people who moved, only 25 also left the American continent. Figure 3³ below shows all American participants who left the continent (N = 25). Six are doctoral students and all are male. They spread out across Europe (2), Asia (2) and two returned to America after doing their master's degree in Spain and Egypt.

While it appears as if some researchers stayed in the United States (green line) this is an optical illusion. The visualization restarts the bundling of groups by continent at each new educational step and therefore what seems like a constant line for individuals staying in the United States is instead a constant line showing how many of those who moved have stayed in the United States at any one time.

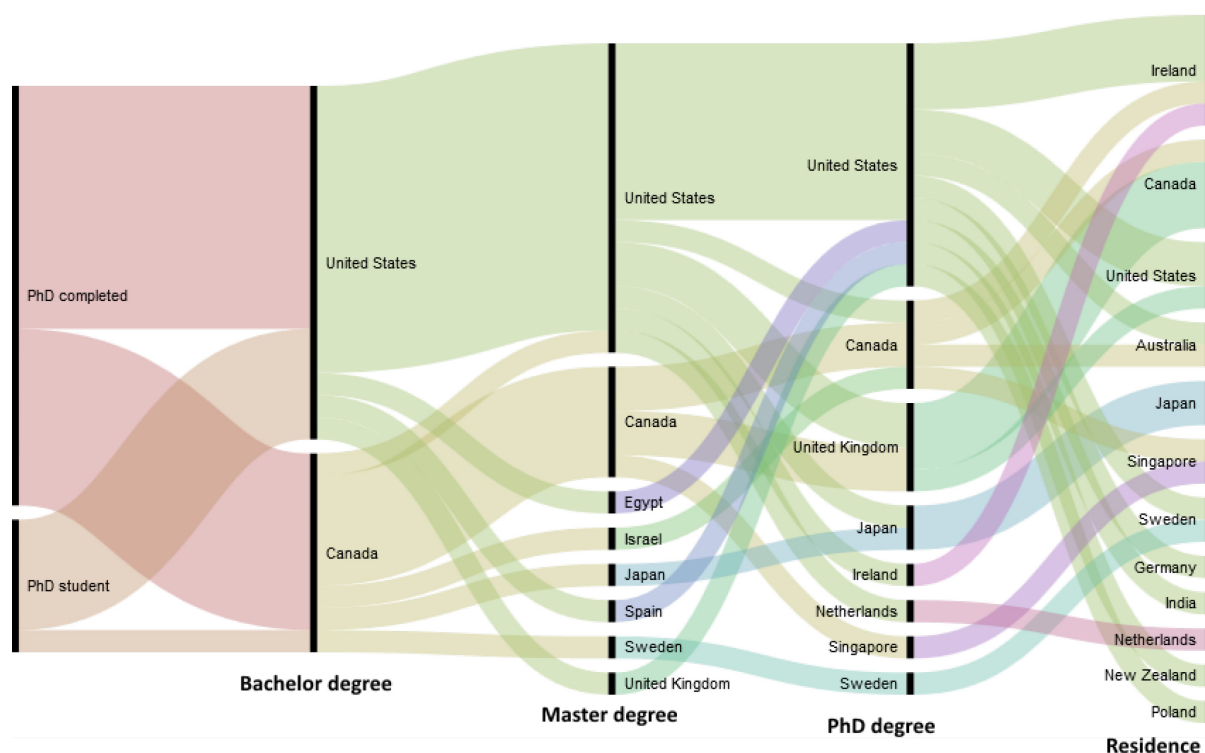


Fig. 3 International mobility of American researchers and American PhD students with a mobility index > 0.

American-born researchers with a mobility index > 0 who hold a PhD degree are today distributed over all continents. While this shows that Americans move to other countries, the figure disguises the fact that many of the countries where Americans moved are English speaking. Figure 4 shows the same results as figure 3, but with a distinction between English-speaking and non-English speaking countries.

All Americans who returned to the United States from Europe completed their PhD in the United Kingdom. The American-born researchers who still live in Europe are in Ireland.

³ Figures created with: <http://app.rawgraphs.io/>

Americans who moved to Asia are in Singapore (2) and India (1) and three other participants are in Australia. This means that only four mobile PhD researchers are in a country (Sweden (2), Germany (1), and Poland (1)) where English is not an official national language.

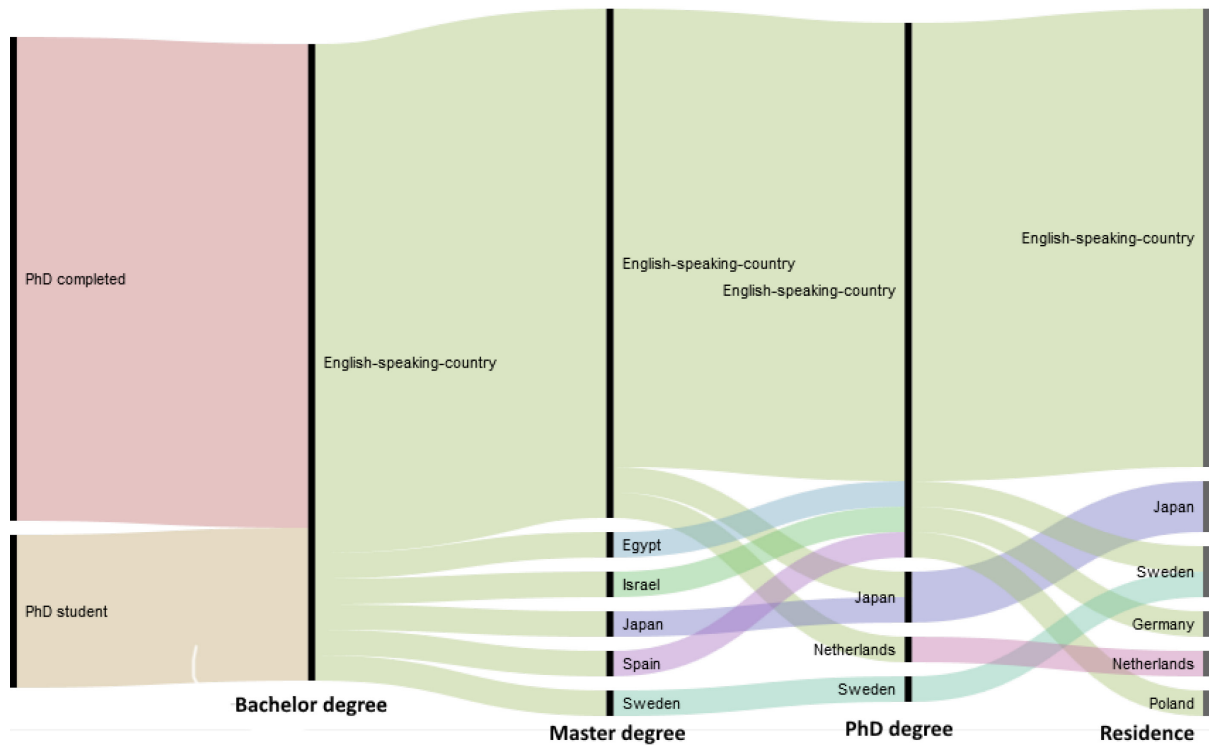


Fig. 4 International mobility of American researchers and American PhD students with a mobility index > 0 divided by English-speaking-countries.

Half of the PhD students currently live in a non-English-speaking country (Japan (2), The Netherlands (1)).

4.2.2 Researchers born in Asia

The dataset includes 219 Asian participants. 124 women and 94 men of whom 136 have a doctoral degree and 82 are studying in a PhD program (Tab. 3). The majority was born in China (117), South Korea (51), and India (27). Japan (7), Taiwan (6), Singapore (3), Malaysia (2), Bangladesh (2) have fewer than ten participants. Four researchers were born in Fiji, the Philippines, Thailand and Vietnam.

| | | status | | total |
|--------|--------|---------------|-------------|-------|
| | | PhD completed | PhD student | |
| gender | female | 76 | 48 | 124 |
| | male | 60 | 35 | 95 |
| total | | 136 | 83 | 219 |

Tab. 3 Asian participants separated by gender and education status.

Table 4 shows the mobility index for Asian-born researchers, one encounters a completely different picture than for the American participants.

| | | mobilityindex | | total |
|--------------|--------|---------------|-----------|------------|
| | | > 0 | 0 | |
| gender | female | 108 | 16 | 124 |
| | male | 73 | 22 | 95 |
| total | | 181 | 38 | 219 |

Tab. 4 Asian participants separated by mobility index.

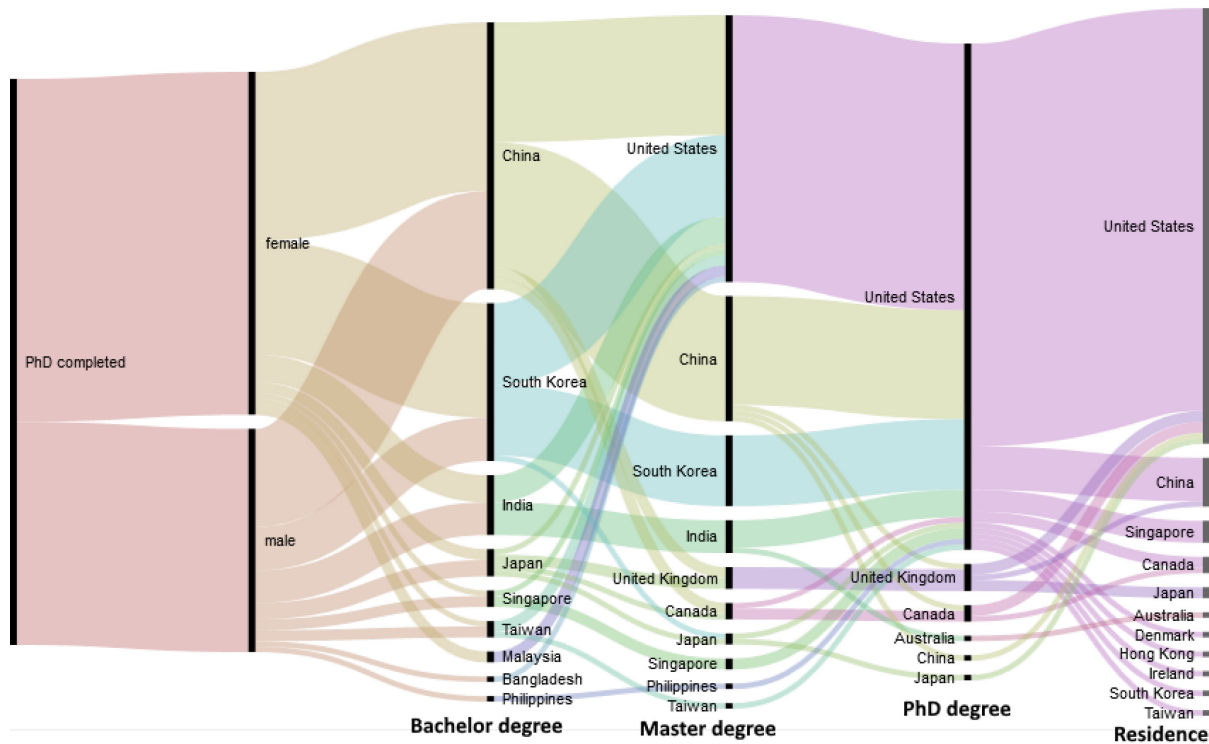


Fig. 5 International mobility of Asian researchers with a PhD completed and a mobility index > 0.

Only 38 researchers never left the Asian continent. No other continent displays such a large number of female researchers who moved to a continent other than Asia. In total 108 Asian-born women left the continent (86.8 % of all Asian female participants). 63 of them hold a PhD degree. Only two women did not earn the PhD degree in North America, but did in Australia or China. North America means mostly the United States in this case, because only one woman out of 61 got her PhD from a university in Canada. Male researchers show a similar high rate of PhD degrees earned in the United States. Five researchers earned their degree in the United Kingdom, one male completed his PhD in Japan (Fig. 5)

The situation for the next generation of Asian LIS Researchers seems to be even more pronounced. Every one of 77 Asian-born researchers who moved away is currently doing the PhD in North America (Fig 6). These numbers are striking in comparison to the seven doctoral

students who stayed in Asia.

The likelihood that most of them will return is low. From the participants with a PhD, only nine women from 63 (Fig. 7) and nine men out of 41 returned to Asia.

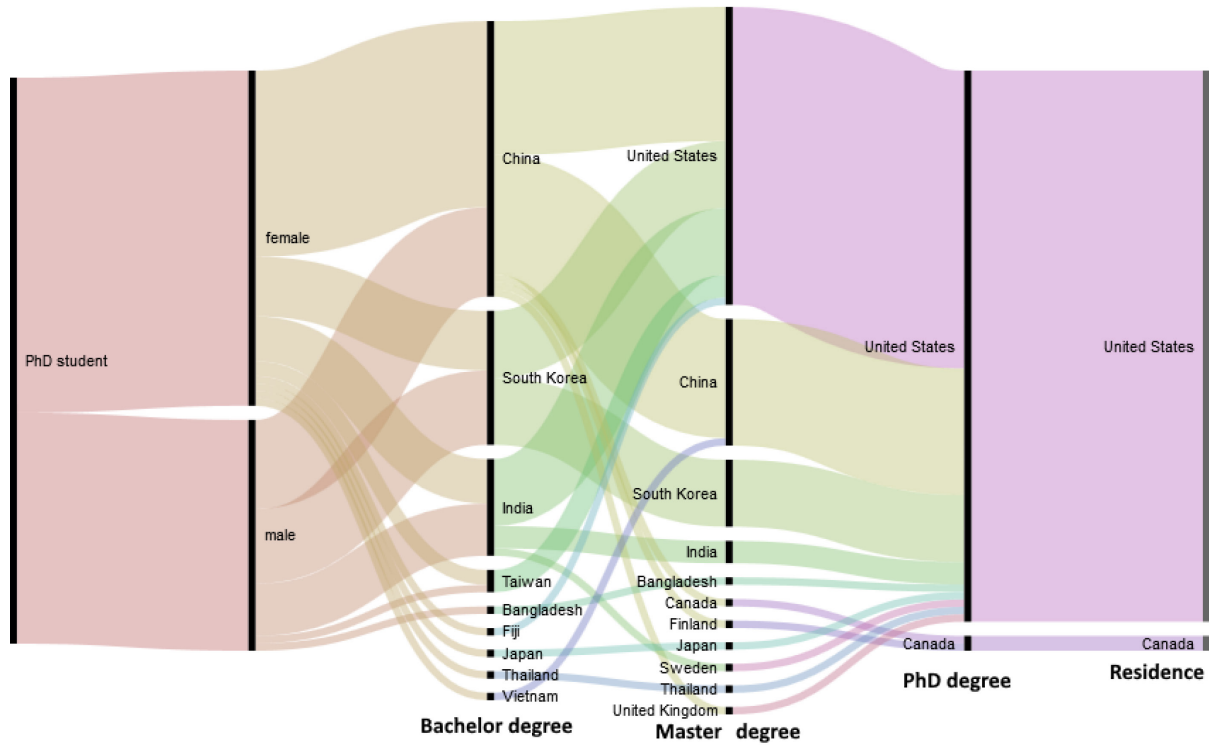


Fig. 6 International mobility of Asian PhD students with a mobility index > 0.

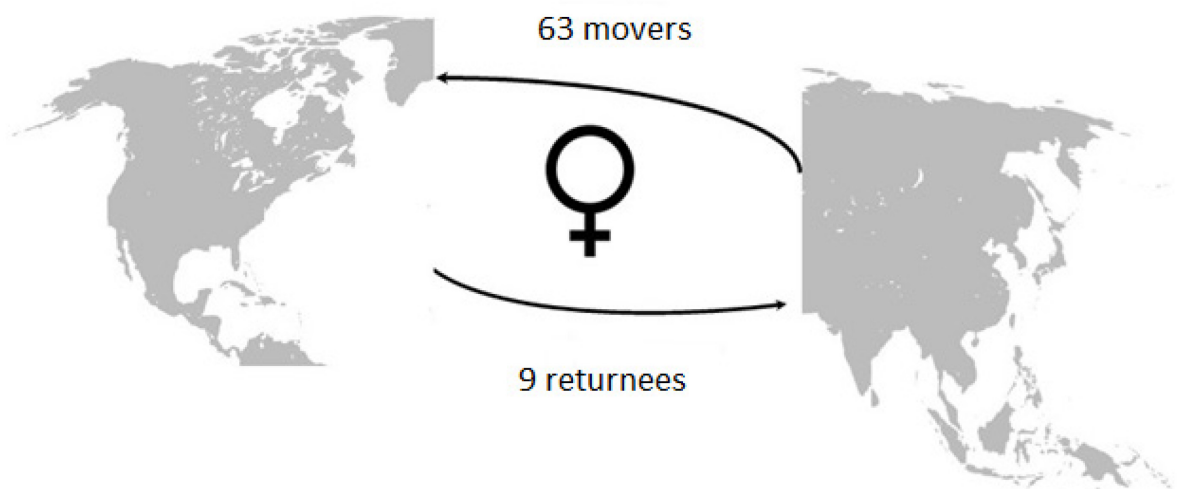


Fig. 7 Mobility to North America by Asian-born women with a PhD degree.

4.2.3 Researchers born in Europe

Of 148 European-born researchers 121 already have a doctoral degree, 53 women and 68 men. There are 12 women and 15 men who are currently studying in a PhD program (Tab. 5)

| | | status | | total |
|--------------|--------|---------------|-------------|------------|
| | | PhD completed | PhD student | |
| gender | female | 53 | 12 | 65 |
| | male | 68 | 15 | 83 |
| total | | 121 | 27 | 148 |

Tab. 3 European participants separated by gender and education status.

Since there are many countries in Europe, figure 8 (N = 148) sums the continent up in three different areas. 65 researchers were born in Northern Europe, 30 of them in the United Kingdom. In Western Europe Germany with 26 people has the highest number of participants. 20 people originally came from Eastern Europe.

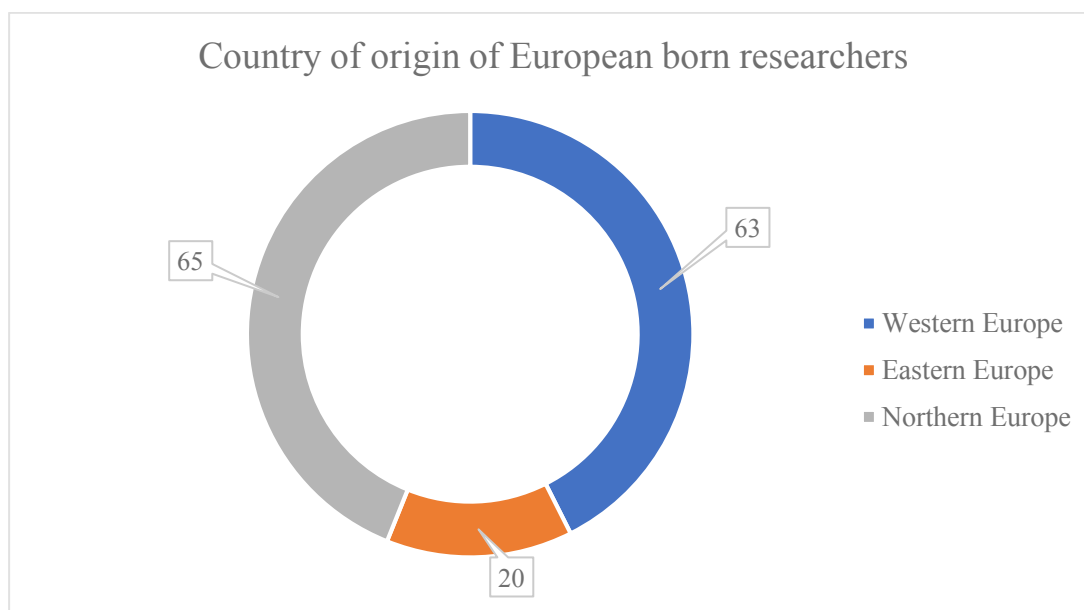


Fig. 8 Country of origin of European-born researchers.

Europe has the most balanced number of *leavers* and *stayers* (Tab. 6). The number of researchers who remain in Europe is higher than the number who moved to another country. But if Europeans leave their continent they go – like everybody else – to North America. 39 of 47 researchers with a PhD degree live in America today. One in Mexico and the others in the United States (33) or Canada (5).

| | | mobility_index | | total |
|--------------|--------|----------------|-----------|------------|
| | | >0 | 0 | |
| gender | female | 32 | 33 | 65 |
| | male | 27 | 56 | 83 |
| total | | 59 | 89 | 148 |

Tab. 4 European participants separated by mobility index.

Only six researchers came back to Europe, two to the United Kingdom and four of them are now a resident in a non-English speaking country (Denmark (1), France (1), Germany (1), and Portugal (1)). Two researchers are in Singapore and Australia, which are also English-speaking countries (Fig. 9).

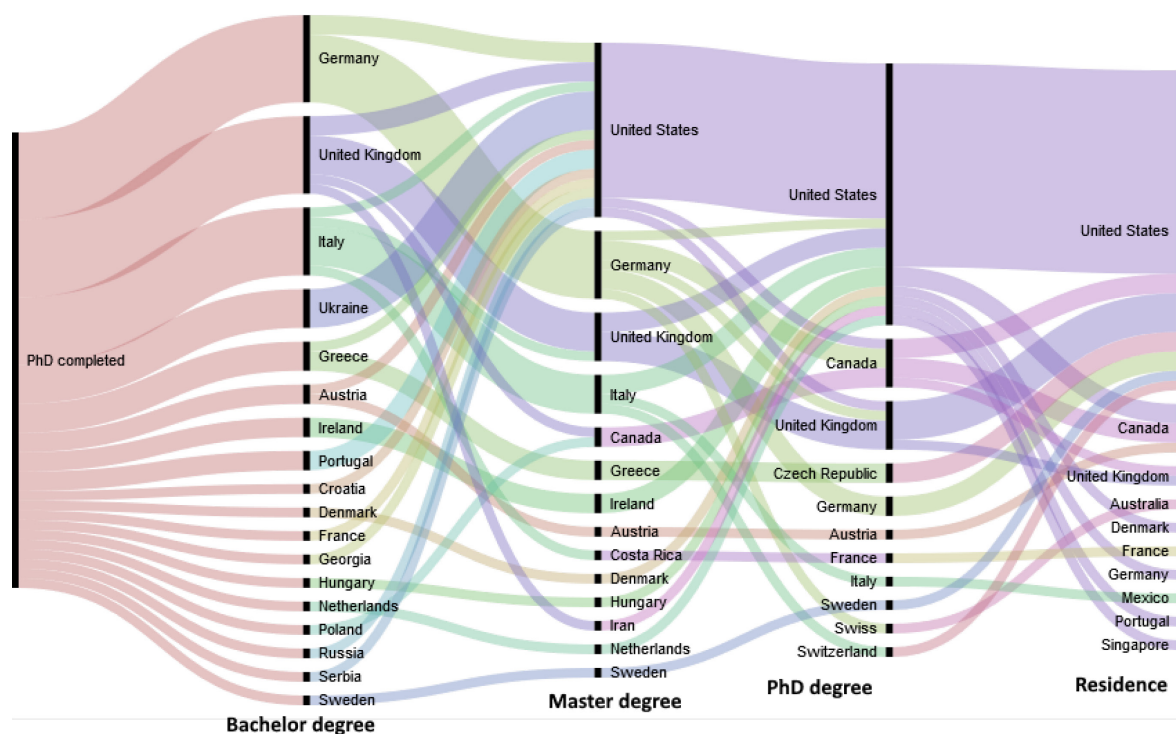


Fig. 9 International mobility of European researchers with a PhD completed and a mobility index > 0.

Figure 10 shows European PhD students who moved to at least one other continent, and the figure shows a pattern similar to Asia, where every doctoral student completed their degree in the United States. Since there is a smaller number of European PhD students who attend the iConference, only 27 doctoral students are included in the sample. 12 of them moved to another continent and all 12 moved to the United States.

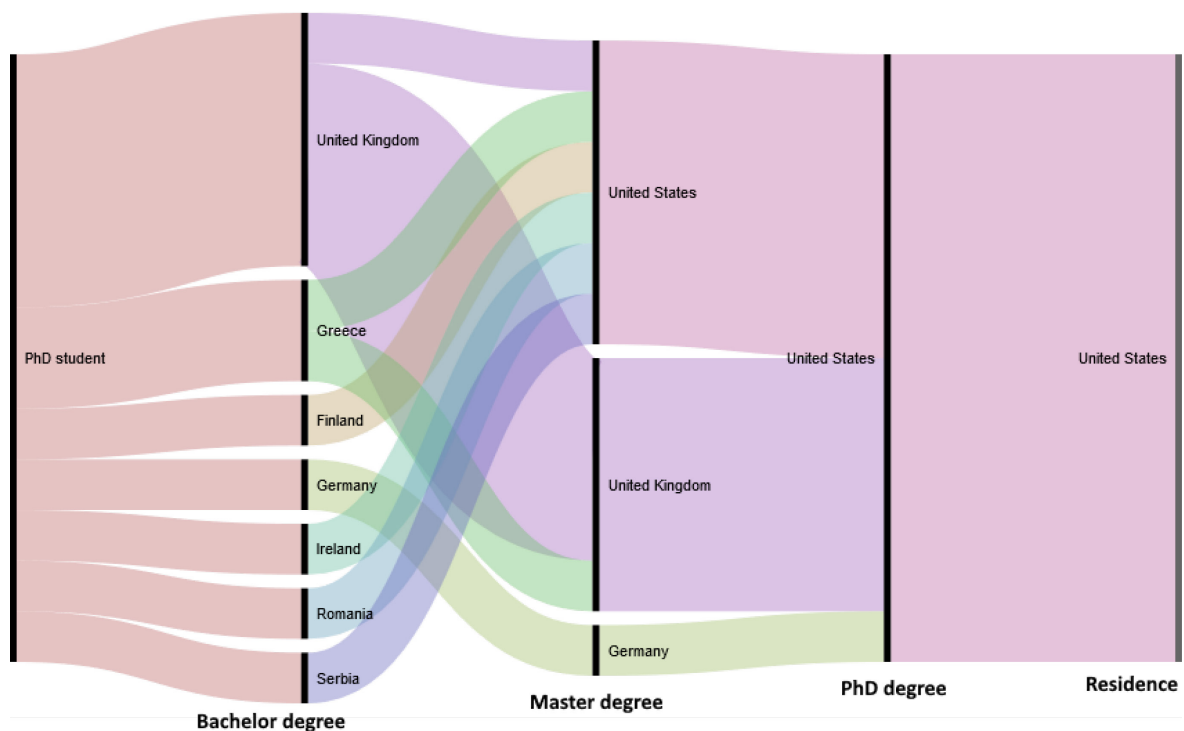


Fig. 10 International mobility of European PhD students with a mobility index > 0 .

Figure 9 masks the fact that many Europeans do not move between continents, but within Europe. Europe, unlike the other continents, unites many languages in a much smaller territory. Changing country means a kind of rootlessness, since one leaves an affective, personal and language territory (Murphy-Lejeune, 2003, p. 65). The challenge of completing a degree in a country that speaks a foreign language is higher than staying in the same language or cultural zone. Table 7 shows an overview of the mobility index of 89 participants from Europe. There are 18 researchers and two doctoral students with a mobility index > 0 based on an Intra-European movement.

| gender | | | mobility index | | total |
|--------|--------|-------------|----------------|----|-------|
| | | | >0 | 0 | |
| female | status | PhD | | | |
| | | completed | 11 | 17 | 28 |
| | | PhD student | 1 | 4 | 5 |
| | total | | 12 | 21 | 33 |
| male | status | PhD | | | |
| | | completed | 7 | 39 | 46 |
| | | PhD student | 1 | 9 | 10 |
| | total | | 8 | 48 | 56 |
| | status | PhD | | | |
| | | completed | 18 | 56 | 74 |
| | | PhD student | 2 | 13 | 15 |
| | total | | 20 | 69 | 89 |

Tab. 5 European-born researchers separated by Intra-European mobility index.

Figure 11 visualizes the flow of the 89 European participants. The largest group of *stayers* comes from the United Kingdom (17), followed by Germany (16) and Denmark (15). 13 PhD students never changed the country. Movement in Europe tends towards Denmark, United Kingdom and Sweden. Only four out of 20 researchers went back to the country they came from (Italy (2) and Denmark (2)). Slightly more women (12) move within Europe than males (8). The only two mobile PhD students are currently studying in Austria and Denmark. The United Kingdom (5) and Denmark (4) attracted most of the researches. Germany is in third place because of the number who stayed (14) and because it has no inflow from foreign students.

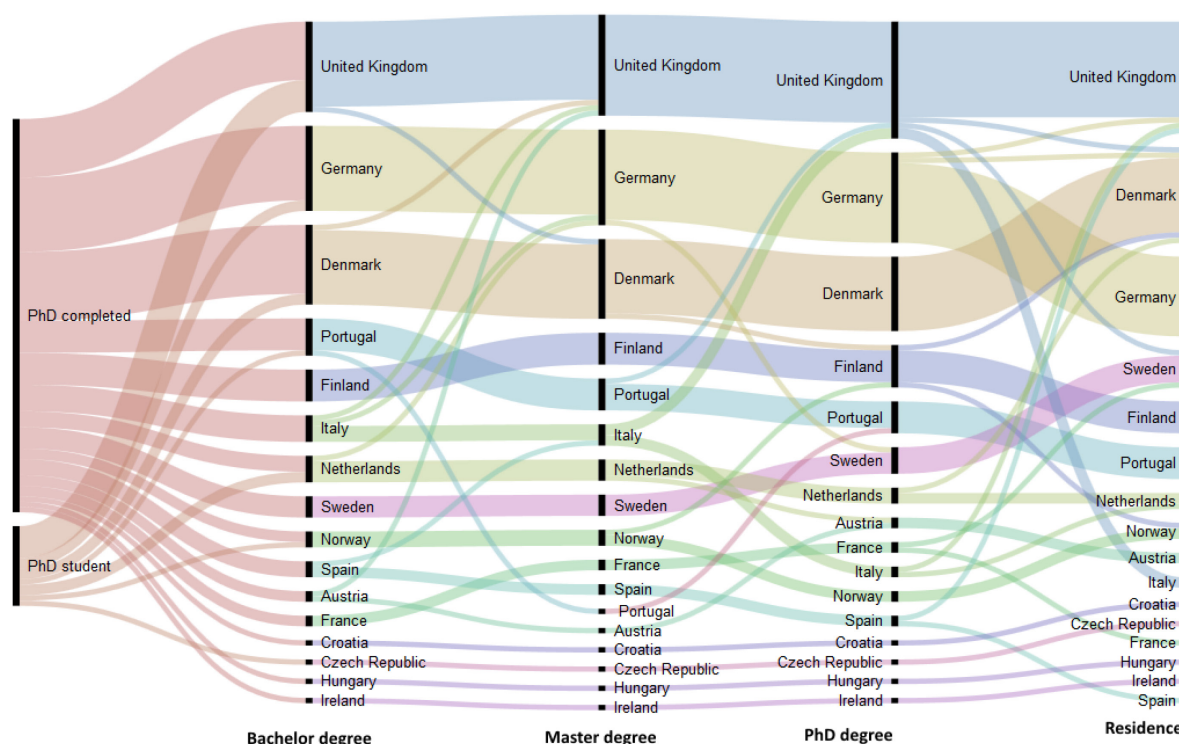


Fig. 11 Intra-European Mobility of European-born researchers with PhD completed and PhD students with a mobility index of 0 and > 0 .

Who is coming to Europe? Out of 110 researchers resident in Europe, 69 never left their country, 20 moved within Europe and six came back after getting a degree in a foreign country. The remaining 15 researchers immigrated to Europe from other continents. Ten from North America, two from Asia, two from the Middle East and one from Africa (Fig. 12). Three of them are male PhD students. Eight of those with PhDs are female and four are men. Nine researchers, including two doctoral students, are now in an English-speaking country in Europe. Two are in Sweden and one each in Denmark, Germany, Poland and the Netherlands.

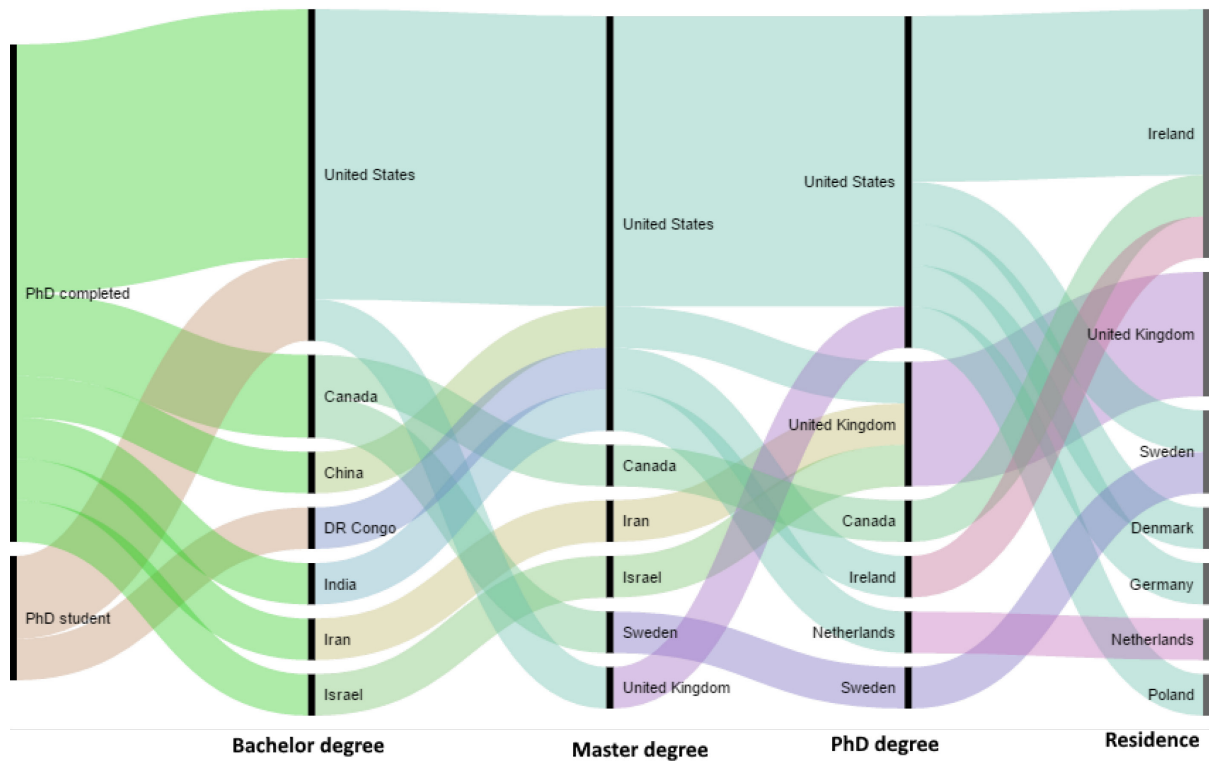


Fig. 12 International mobility of researchers with PhD completed and PhD students moved to Europe from another continent.

4.2.4 Researchers born in Africa, the Middle East or Australia

Because of their comparatively small number, participants from Africa, the Middle East or Australia were merged into a single group. 51 researchers from these regions were authors or/and reviewers in the last three iConferences (Tab. 8). 36 PhDs and 15 doctoral students; 26 females and 25 males. Only nine people never left their home country (Australia (3); Israel (6)). As we can see in figure 12 mobile researchers from Africa, the Middle East or Australia showed the same moving behavior like Asian researchers. Only four people returned to their home country. All others now live in North America, or in the United Kingdom. Two of those who returned are from Australia thus the non-English speaking countries are outnumbered (Fig. 13).

| | | status | | total |
|--------------|--------|---------------|-------------|-----------|
| | | PhD completed | PhD student | |
| gender | female | 19 | 7 | 26 |
| | male | 17 | 8 | 25 |
| total | | 36 | 15 | 51 |

Tab. 6 Participants from Africa, Australia and the Middle East separated by gender and education status.

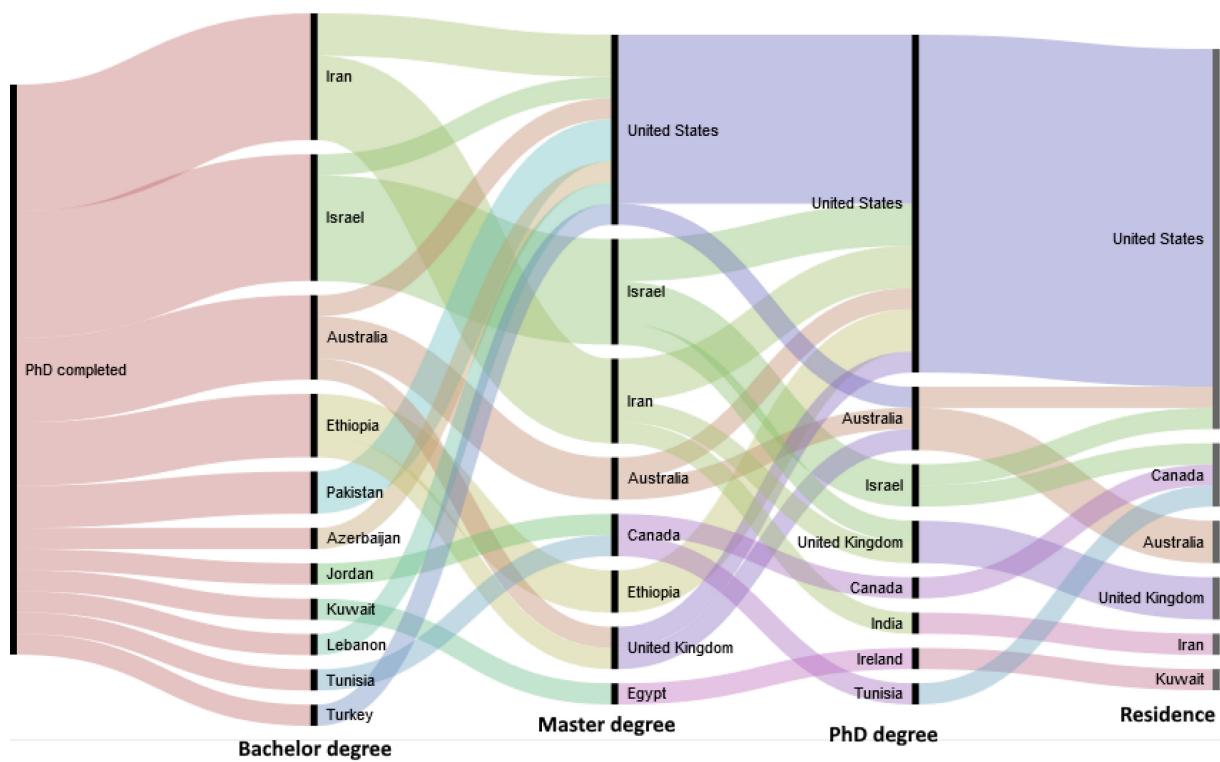


Fig. 13 International mobility of researchers with a completed PhD from Africa, the Middle East and Australia and a mobility-index > 0 .

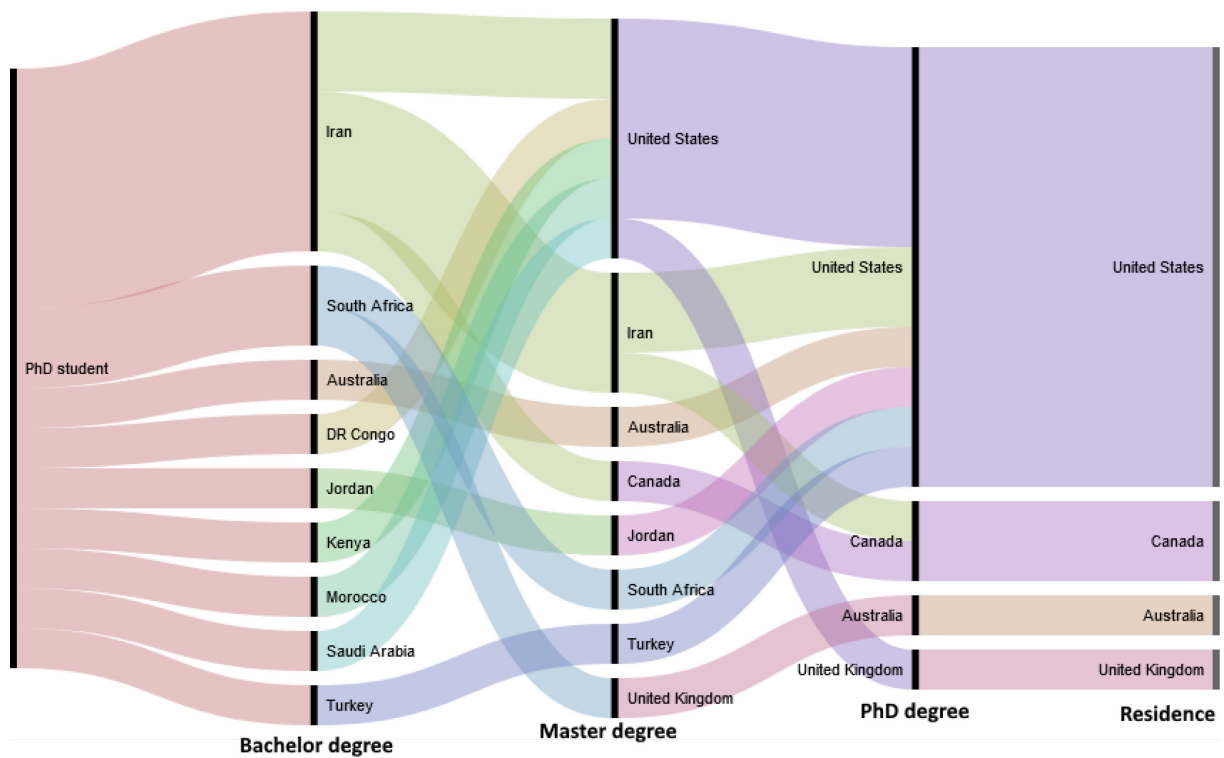


Fig. 14 International mobility of PhD students from Africa, the Middle East and Australia with a mobility index > 0 .

All doctoral students moved to an English-speaking country (Fig. 14). This does not necessarily mean that the totality of PhD students from these countries leave their homes. But it means that the doctoral students in this sample, who can participate in this highly competitive conference, tend to move.

4.2.5 Impact of English on mobility

All English-speaking countries attract foreign graduates because English dominates the research sector as the main language. Marginson (2006) points to the importance of English for global research. Two thirds of the top universities worldwide are in English speaking nations. Except for the United States, the mobility pattern is similar for all continents. Immediately after the bachelor's degree, half of the ongoing researchers move to an English-speaking country (Fig. 15 and 16). After the master's degree, the next half follows.

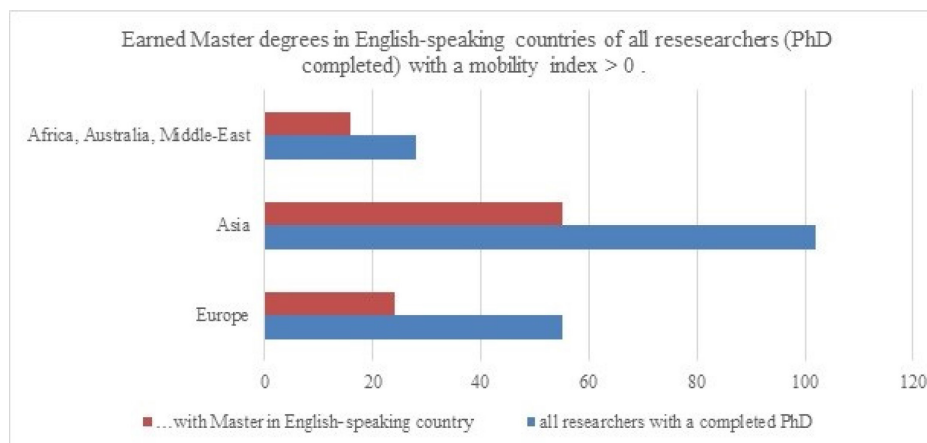


Fig. 15 Earned master's degrees in English-speaking countries of all researchers (PhD completed) with a mobility index > 0.

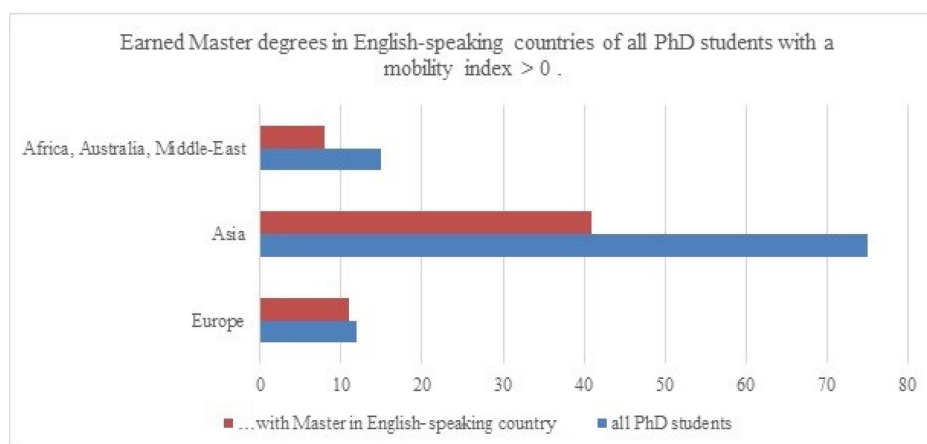


Fig. 16 Earned master's degrees in English-speaking countries of all PhD students with a mobility index > 0.

4.3 Discussion

Two facts are clear after analyzing the mobility of the 882 researchers in information science. Half of all who were analyzed are Americans who mostly never left their continent. On the other hand, the other half of researchers from Asia and Europe shows a high rate of mobility towards North America. For Asia, this problem exists not only in LIS (Furukawa, 2012; Marginson, 2006; OECD, 2008). The reasons behind the Asian *brain drain* are two-fold: Asian states historically encourage students to study abroad (Do/Pham, 2016; Lucas, 2001; OECD, 2008), and, the bad labor market in some countries prevents a return (Jonkers/Tijssen 2008). This is particularly true for women. Since the mid-1980s the number of Asian women studying abroad and staying are rising. Kim (2012) conducted a qualitative study with 60 women from China, Japan and Korea to understand the role of the media regarding the decision to move to the west. The findings revealed that for these countries, the gap between educational expectations and the reality of work inequality is one reason why women stay in foreign countries. If females want to have a chance in the national labor market, they need a so-called “golden certificate” – a master’s degree in English (Kim, 2012).

A reason for concern might be the lack of participation from continents like Australia, Africa or the Middle East. Only doctoral students with a degree from an English-speaking country decided to be part of the iSchool community. As a minority in the iSchools group, these countries suffer even more from the migration of their active researchers to America.

Europeans generally favor short time mobility and circular migration (Ackers, 2005; OECD, 2008). A postdoctoral career phase in the United States is a standard practice for Europeans too (Laudel, 2003). This study demonstrates that there is a high long-term drainage of European researchers to North America.

Americans seem not to be too motivated to leave their continent at all – not even to English-speaking countries on other continents. In her report, Marginson (2006) writes about three factors that structure the global hierarchy in research: the distribution of research, the global advantage of English and the global dominance of the United States in higher education. The first part of the study validates all her points.

It also validates the quote from Laudel that whoever can go to the United States does so and tries to stay there. But still, the impression the results leave behind raises the question of whether the Bologna process really changes anything for Europe, when it comes to facilitating student mobility and improving employability. Only some parts of Europe seem to be attractive for international students and researchers, and they are English-speaking. Does it all come down to

the language? Or is there a career-based motivation behind movement of researchers?

To find answers, the author conducted interviews with information scholars from the quantitative sample as part of the next analyses.

5 Push and pull factors of international mobility of European information science researchers

5.1 Methodology

For the qualitative data sample the author wanted to conduct 20 interviews with information science researchers selected from the quantitative data sample. Considering the limits of time for this thesis, the author decided to concentrate on interview partners who had been born or are resident in Europe. To ensure a good distribution, at least five of the researchers should be doctoral students and at least seven doctors should be *stayers*.

The 147 European-born researchers were separated in doctoral students and researchers with a PhD. Then randomly 15 PhDs were chosen and five PhD students. The author searched online for contact data. Due to limited responds in the first round, a second sample with the same numbers of participants was generated. The response rate stayed low, in part because some researchers had no available contact data. In the end the author invited 57 researchers. After a month, the final sample consisted on 12 replies of researchers with a PhD and four replies of doctoral students (Tab. 8).⁴

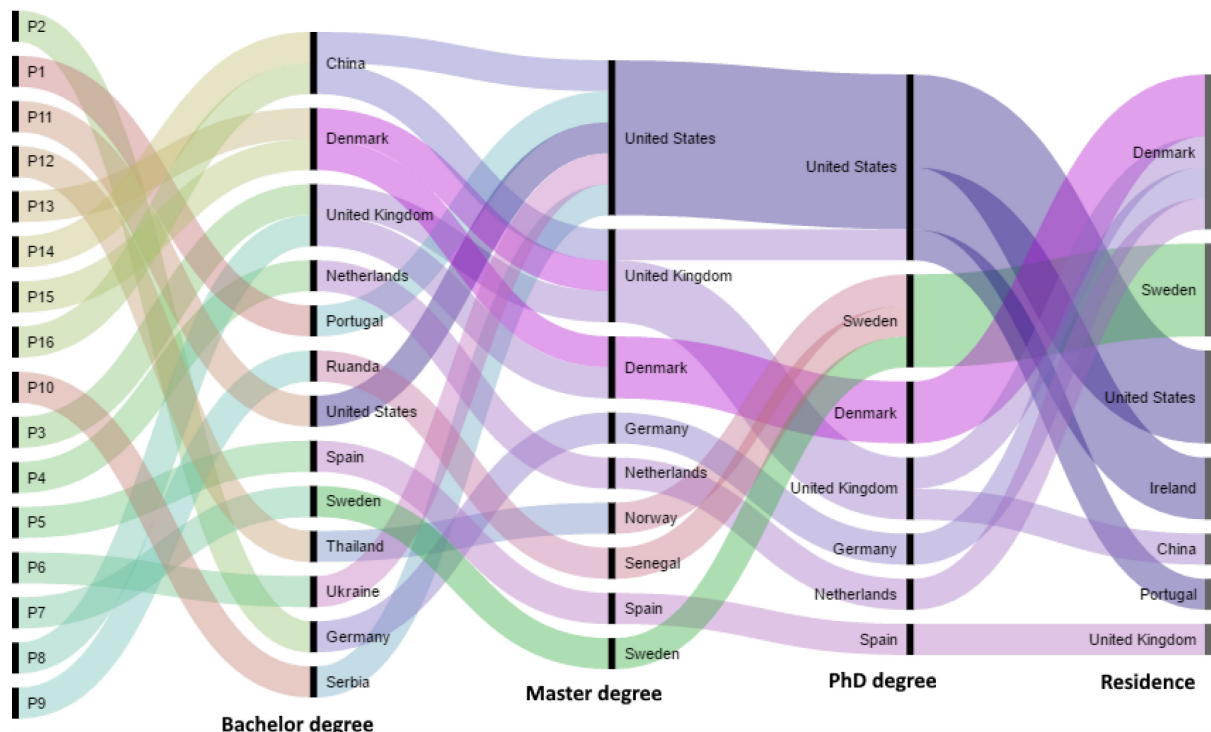


Fig. 17 Mobility patterns of interview participants.

⁴ P10 earned her PhD degree shortly before the interview. The author updated the data for the analyses.

Figure 17 shows the educational stages of all interview participants sorted by size of the country of residence. The rate of *stayers* in the sample is lower than planned earlier. Only two researchers never left their home country (Tab. 9). The low response rate could be traced back to language barriers, since the author could only offer interviews in German or English. Of the remaining 14 participants three returned to their home country after their PhD degree and eleven are *leavers*. The rate of replies from doctoral students was equally low. Available contact data for this group was hard to find or outdated. Therefore, the author got in contact with two doctoral students who were recommended but were not part of the quantitative data sample. For the semi-structured interviews the author developed three different interview guides, depending on whether the participant was a *stayer*, a *leaver* or returned to his home country.

| participant number | gender | category | phd completed |
|--------------------|--------|----------|---------------|
| P1 | male | returnee | yes |
| P2 | male | leaver | yes |
| P3 | female | leaver | yes |
| P4 | male | leaver | yes |
| P5 | male | leaver | yes |
| P6 | female | leaver | yes |
| P7 | male | stayer | yes |
| P8 | male | leaver | no |
| P9 | female | leaver | no |
| P10 | female | leaver | yes |
| P11 | female | leaver | yes |
| P12 | female | leaver | no |
| P13 | famale | returnee | yes |
| P14 | female | leaver | yes |
| P15 | female | stayer | yes |
| P16 | male | returnee | yes |

Tab. 7 Interview participants divided by gender, category and education status.

All participants were asked about their reasons for international *degree mobility* and their information behavior in their research. The information behavior questions should explain if *degree mobility* influences traceable researchers' habits when it comes to research. The author assumes researchers were moving or moved in to a new research environment to get more contact with new research topics or habits that could influence them. This does not automatically mean that they become better researchers, but it should illustrate differences between research cultures and their advantages or disadvantages for doing research. As all interview partners were of different ages and moved at different points in their life, asking for changes in information behavior contains two risks. First, some researchers moved a longer time ago than others. This part of the study relies on autobiographical memory. There is no way

to control the truthfulness or the accuracy of such memories. Second, the time when someone left a country can be crucial for information behavior because of differences in technical or political circumstances. The author addresses this in more detail in chapter 6.

To adjust for the time difference, the author asked the participants who had teaching experience how they assess the situation of their own students when it comes to *degree mobility*. Since Europe has a long tradition with ERASMUS and short time mobility, the separation between short time and *degree mobility* in some interviews was often difficult to distinguish. The author will indicate on this separation in the following analyses.

| participant number | category | english native speaker | informaton science background |
|--------------------|----------|------------------------|-------------------------------|
| P1 | returnee | | |
| P2 | leaver | | |
| P3 | leaver | x | x |
| P4 | leaver | | x |
| P5 | leaver | | |
| P6 | leaver | | x |
| P7 | stayer | | x |
| P8 | leaver | x | x |
| P9 | leaver | | x |
| P10 | leaver | | x |
| P11 | leaver | x | x |
| P12 | leaver | | x |
| P13 | returnee | | |
| P14 | leaver | | x |
| P15 | stayer | | x |
| P16 | returnee | | x |

Tab. 8 Information about native language and research background of interview participants.

A variable that did not get collected in the quantitative data sample is the scholarly background of the researchers. Even if the iConference is a meeting of LIS schools, a large number of the participants have no LIS background. For questions about changes in the information behavior, this creates problems. The best way to compare behavior is with the same conditions. If a participant studied another research field in a previous country, the research habits and behavior are not comparable as every research field has different research styles. Some researchers never studied information science at all, but another research field. Therefore, some questions could not get answered completely by those participants (Tab. 10)

As a methodology for the interviews, the author chose online interviews. Online Interviews are carried out with computer-mediated communication (CMC). This may occur using computers, cell phones, or mobile devices and allows to communicate with one or more participants using text chat or messaging, multichannel, web conferencing spaces, video conferencing, or interactions in virtual world or games (Salmons, 2015). The author conducted interviews with

individual participants via Skype (IP telephony service provider) or Adobe Connect (video conference system). 20 minutes per person was planned but this time was mostly exceeded. All participants were asked for permission to record the session and the recordings were transcribed with MAXQDA. The author had already developed a provisionally code inspired by an article of Laura Rumbley (2011), who reviewed the existing literature on mobility obstacles and incentives. She defined three greater areas of incentives for mobility: financial, curricular and personal (ibid., p. 200). The author used these three areas to build a coding scheme, but without designations like obstacles or incentives to limit negative or positive connotation. For Rumbley, language is part of the curriculum incentives and barriers. As language seems to play an important role in the quantitative results, the author decided to create an extra code for it.

Financial, personal and curricular factors got a subcategory for students. These extensions grew

Code tree for mobility:

- financial
 - financial students
- personal
 - personal students
- curricular
 - curricular students
- language

from speaking with researchers who teach at their universities. A second code was developed during the coding for mobility reasons. While speaking of disadvantages and advantages of mobility for their own research, most researchers started talking about the circumstances in which they are doing or had done their research. These descriptions included technical, financial or political aspects. Based on this, the author created another code tree for research environment:

Code tree for research environment:

- infrastructure
- research culture
- financial resources
- politics
- time

The results of the qualitative analysis start with push and pull factors for information scholars and pass over to the model of characteristics of a research environment.

5.2 Financial factors

Financial reasons and curriculum reasons go hand in hand when income is a job priority. One participant applied for jobs in foreign countries because he knew finding a job in his home country would be very difficult. For him the important thing was to get a job, and to earn money with the subject he studied. This attitude led him to Denmark where he still lives. Then again, a doctoral student said:

“I like to try different things and this was an opportunity to do a PhD that was fully funded. That was the second. I mean I had a good salary in the UK and some people considered it quite crazy to leave as I was doing.” (P8, PhD student, leaver)

Another doctoral student did her PhD degree via a cooperation between two partner universities, one of them in Sweden. She got the fully funded position through a competition. An interview partner said about the PhD funding situation in the UK:

“But the thing that is really hard is getting funding. A PhD position does not come with funding. So...I was lucky enough to apply for a PhD for a project that already had funding. So, I just had them to get them to want me as their PhD student. I did not really have to go out and get the funding agency to fund my project.” (P13, PhD completed, returnee)

In a case of a participant who moved from Europe to the United States, her workplace was willing to pay for her visa. Because she had no Green Card at that time, the funding allowed her to stay.

Another aspect is not only the person's income that lead to moving, but the partner's situation. P5 moved with his family because it was problematic for his wife to find a job in Spain. He talked about another financial aspect of mobility, namely that moving is “*awfully expensive*”.

5.2.1 Financial factors for students

Rumbley (2011, p. 201) writes about a “*gap in information or analysis about financial incentives for degree mobility across Europe*”. Typically, the financial funding from host countries are scholarships or grants and this funding is more visible for doctoral or post-doctoral students (ibid.). For short time mobility, students normally depend on the financial support their home country will give them or that their families can provide. A professor assumed Danish students are not going to study abroad because of the fear of losing their financial support from

the state, if their study takes too long. At the same time a Danish professor, who earned her master's and PhD degree in the United Kingdom, praised the financial support the Danish students get, while in the United Kingdom most students must either work in addition to studying or must take on debts. When asked, why a Swedish university has a high international enrollment, a professor answered that the possibility of distance education seems to be attractive for working students.

5.3 Curriculum factors

Just as financial reasons can be influenced by curriculum factors, and the other way around: curriculum factors can be influenced by personal reasons. A researcher moved from her stable position in a US embassy to the United States because she married. There she decided to study LIS and became a professor in this research field. The same reasons lead another researcher from Hong Kong to the United States, where she did a PhD degree in LIS and then moved to Europe for a permanent position. Improving employment is an important reason to move to a foreign country. The possibility of a permanent contract or a higher position combined with the possibility of having one's own research agenda seems to be a push factor or as P5 said:

“I saw myself applying for a three-year position somewhere...or for a four-year position somewhere else would have meant driving my family to one place and another and still having very stressful jobs not being able to have my own agenda for research. Because you work with a professor with his own agenda. I thought this was not the way to go!”
(P5, PhD completed, leaver)

The option of being without a job is an even higher push factor for applications in foreign countries. Four researchers moved to another country because they got offered a job there after they were unemployed for some time or would have been soon.

“Well that is basically because I was offered a job. So...as you probably know as an academic you kind of just have to apply for positions in very many different locations.”
(P14, PhD completed, leaver)

This awareness of future perspectives exists already in the PhD level:

“Ok, so basically, if you do your PhD you cannot be too selective about your first job! And so, planning goes out the window. So... there is an ideal. But then that never necessarily comes up, if you know what I mean.” (P8, PhD student, leaver)

Another reason for leaving a country for studying is when the research field does not exist in one's own country. Two researchers faced this problem. He moved to the United States, she to the United Kingdom. Both returned after their PhD to work in their home country. He only went away to pursue a degree and she wanted to go home. Literally only P16 said he left his home country to pursue a degree. Also, he returned after his PhD to his home country because of home sickness. Other participants described the need for studying in a more international environment, having new experiences and gathering knowledge as a push factor in their decision to move. In some cases, the choice of a certain country happened for a specific reason, like P1 who wanted to get educated in the United States because of the good universities, P12 who went as second choice to Sweden because all her associates were studying in the United States, United Kingdom or Australia, or a researcher who wanted to study in the United Kingdom because for her the environment there was as international as possible.

As one of the negative factors for mobility a participant said:

“Like people my age here are already in higher statuses as me. Having more or less the same amount of experience but they were always inside. So, you know? [...] You pass the ball backwards. You know you move a little bit backwards from one country to the next. [...] But you need to move backwards. You go from a very stable position to a little bit less stable position and you grow up there. This is what happens when you move abroad! Because the profiles do not fit.” (P5, PhD completed, leaver)

Another negative aspect of moving is building a new network. Building up a research network takes time. Moving away from a country means on the one hand taking with you parts of your old network, but on the other hand it also means having to build a new one. Finding a job sometimes requires a good network in a country and for P4 this was one reason *“for sticking around.”*

5.3.1 Curriculum factors for students

P4 recommends studying abroad to students:

“So, it gives you sort of a different perspective and learning a different culture teaches you a lot about your own culture and some of the weirder things in that culture...so I think that is why I would it recommend. And it is good for your CV!” (P4, PhD completed, leaver)

Speaking to different people allows students to build up their own research “toolbox” and the more tools they have, the more they can combine them.

While studying abroad is recommended, most professors report that, for their students, studying abroad has a curricular disadvantage. Short time mobility is perceived as a temporal obstruction for Danish students. Irish students complain that they have too little time to study abroad. International internships are more popular because students can meet their potential employers. In such cases the institution can give access to professional networks. A professor made a difference between job-oriented degrees and research degrees:

“Yes, for job-oriented degrees I see more benefits of staying local. And then maybe if we review the PhD then it is a different story because then you are really becoming an expert who could be like anywhere and you really want to master his or her skills [...]!”
(P6, PhD completed, leaver)

One key issue Europe faces is an *effective recognition of degrees earned abroad* (Rumbley, 2011, p. 201) especially at the undergraduate levels. A participant wanted to return home after her master’s degree, but the Danish system did not recognize her foreign degree, so she did her PhD in the United Kingdom to level out the problem. P3 also moved from the United Kingdom to Denmark with a bachelor’s degree and had to start her education from scratch because Denmark did not recognize her degree at all. P11 told about a student in the United States, who did her bachelor’s degree in Canada. Although the degree got state recognition, the student had problems with a failure to recognize the equality of the education from a foreign country.

5.4 Personal factors

Of 16 people, only three did not mention personal factors as an influence on their decision to stay, leave or return. Two of the three participants are PhD students who plan to return to their home country because they are doing their PhD in order to support developing a better research culture in their home country. For the other thirteen interviewees, the partner, family or kids played or play a role in relation to mobility. One scenario can be that the partner is the reason to move to another country. Five researchers left their home country to be together with their partners. A second scenario is having children. Children are a reason to stay in the home country:

“I was fully occupied to trying to manage me my studies at the University of Gothenburg and I did not really strike me as an opportunity at that time. And when I then came back

to academia so to speak after being a librarian for some 15 years I had kids. And you know...family!" (P7, PhD completed, stayer)

"Because I had a family and it was not really possible for me. I would like to but it was practical issues that did not make it possible." (P15, PhD completed, stayer)

Children are a reason to stop being mobile:

"And of course, if you have family and kids, because then another one was born in Vienna...you look for a moment...you want to work in one place." (P5, PhD completed, leaver)

P14 said it would be impossible for her to go back to Hong Kong, because her kids do not speak Chinese. So, children can be a reason not to return to the home country as well. A participant declares he would move back home, but his child is too young. One participant provides a reason to leave the United States:

"[...] also, personally my husband and I - we do not have children - were always interested in living outside of the United States at some points in our live." (P11, PhD completed, leaver)

The relation between mobility, research and family was described by a female researcher:

"[...] a classic situation for women who have young children. I think it is a disadvantage compared to colleagues who are more mobile. And they have the luxury to go out. So, it is...at job interviews or a yearly assessment I have to say...you know...I have others, not just my research, to be aware of." (P3, PhD completed, leaver)

The third scenario is that parents or family relatives are a reason to return to the home country. Four participants claimed that they wished to return to their home countries because of their family, two of them did. P8 as doctoral student would prefer to move back from the United States to Western Europe because he would be closer to his family and P11 sometimes thinks about going back to the United States because of the age of her parents and her husband.

Two participants say they would leave again. P4 to Canada or the United States since he describes himself as an anglophile. P10 expressed her discomfort with the feeling of being an immigrant:

“You feel like this is not really your country. You are not born here. You are not educated here. You are not raised here. And there are all these values that you grow up with...it is not easy.” (P10, PhD completed, leaver)

5.4.1 Personal factors for students

For students, the same applies: Being away from family and friends can be a negative factor during their study abroad. One professor mentioned how much their students love the area they are living in. So much they would sacrifice better jobs somewhere else before leaving. For P11, one important requirement for studying abroad is the curiosity to have new experiences.

5.5 Factors of language

In the fourth place among the obstacles for mobility Teichler et al. (2011, S. 8) reported *“foreign language skills deficiencies.”* Changing country means a kind of rootlessness, since one leaves an affective, personal, language territory (Murphy-Lejeune, 2003, p. 65). The challenge to conclude a degree in a foreign-language-speaking country is higher than staying in the same language or cultural zone:

“Well you know my...I am French speaker. We use French. Now shifting from French to English it is not easy. Yes, it is challenging.” (P9, PhD student, leaver)

In work life, language barriers restrict your options for job applications:

“You can get a sense that I have to apply anywhere that would be English speaking. [...] Because I cannot go to Germany or I cannot go to Denmark because you have to teach in a different language.” (P14, PhD completed, leaver)

Language has the highest impact on mobility when people choose a specific country because of the language:

“It was in particular the UK because of the language. When I was in school in Swaziland it was a Scottish run...in English language an international school.” (P13, PhD completed, returnee)

Learning a foreign language is a motivation to consider moving to a country where the language is official. Two researchers, who moved to the United States, had already decent English skills.

One because of her previous workplace in a US embassy and the other because of her previous study:

“And one of the reasons why I was interested in immigrating to an English-speaking country, or in just visiting it, was that I was studying English language and literature. This is always the case if you are studying a language. You always want, at some point, to visit the country where that language is spoken. So, there was also that motivation, you know.” (P10, PhD completed, leaver)

Being a native speaker in a widespread language eases the process of settling in a foreign culture:

“I think that if you are a native English speaker and you are moving to another, you know, English speaking country or at least where the dominant language is English. ...the transition is smooth.” (P8, PhD student, leaver)

Europe has no common language, so, leaving one's own language territory happens easily. However only three participants had to learn a new language when they moved, and all three moved to Denmark.

For eleven mobile researchers, who were not native speakers, English played an important role in their education and work environment. The three *returnees* all first moved to English-speaking countries and then back home (Portugal, Denmark and China). The two doctoral students were living in a non-English-speaking country but did their PhD program in English. Six researchers are living currently in an English-speaking country (United States (3), Ireland (2) and United Kingdom (1)).

5.5.1 Language as factor for students and research

13 participants had experience in teaching. The author asked about skills students must have to study abroad or to do international research. Five lecturers mentioned language in this context. They agree that English is the language for international education and students should speak and write English properly. One interview partner encourages his students to write in English because:

“I think your research has a bigger impact if it's in English than if it is a language that only what...23 million people speak, if you write in Dutch.” (P4, PhD completed, leaver)

The same participant made a clear difference between *credit mobility* and *degree mobility* when it comes to language skills. For short time mobility, like a semester exchange, learning the native language of another European country is not absolutely necessary, but completing a degree is only possible if you speak the language properly. In some European countries, it is now sufficient to know English because the universities started international programs. Two lecturers teaching in an English-speaking country remarked about how indignant their English-native students were about learning a foreign language. Not having the language skills leads to missed opportunities for studying outside of English-speaking territories.

5.6 Information behavior in relation to mobility

In the methodology, the author mentioned difficulties with information behavior related questions in the interviews. The following results involve only the 14 participants who earned at least one degree in a foreign country. If a person had moved more than once, the question referred to the latest move or the one that had something to do with work or studying reasons.

5.6.1 Influences of information about an institution on mobility behavior

Six researchers said they had not informed themselves about the institution they wanted to attend in the foreign country. In three cases, it was because they moved for personal reasons and only then decided to start studying. These researchers studied another field in their home country and switched to information science in the foreign country. In another case the degree mobility preceded an exchange semester within the ERASMUS program. Normally ERASMUS has contracts with specific universities and so the institution cannot influence the decision. As the participant started her master's degree in the United Kingdom, the choice of the institution was limited by her choice of a rare research field. The fifth researcher had already finished his doctoral degree before he decided to leave his home country. His decision to move was influenced by the conviction:

"[...] where I get a job, I go there first, because to be unemployed is not a permanent solution." [translated into English by the author] (P2, PhD completed, leaver)

For P5 a primary reason to apply to his current institution was he knew that people were there with similar research.

One doctoral student and one researcher already knew people in the institution. They were offered their positions via these contacts. The other two doctoral students participated in

collaborations between two universities. As with the ERASMUS program, the possibilities were limited by a partnership.

Four researchers said they informed themselves about the institution they applied to.

“I suppose that is very important for an academic...even when you are applying for a position...even though there are many Library and Information studies schools. You could be doing very different topics of research in different places. So... you should definitely look up who is working on what ...sometimes you actually will have to be recommended...to people in the school.” (P14, PhD completed, leaver)

P11 also informed herself about the department and the topics her future colleagues were working on. A researcher who moved to the United Kingdom for his master’s degree, and chose the institution after he read about it, decided that this school was the best option.

5.6.2 Influences of mobility on research topics, research habits and information access

Within the interview the author asked the participants about their current research topic and how they learned about it. The interview partners had various research backgrounds: information practices, information literacy, geographical information studies, information systems, Bibliometrics, social media analysis, research sharing between libraries, public libraries and open data, international consequences of systematic storage of information, heritage data or text mining.

These topics were influenced by lecturers, dissertation advisors or colleagues, or if not through people, then through courses, government priorities, jobs at the university, dissertation topics, PhD programs or PhD scholarships. One participant answered:

“It is about serendipity. Of course, your work shapes you...now...if I have to set a curriculum today. [...] I would not explain all those very personal and serendipitous events that made it happen. And instead I would probably build a narrative that made sense.” (P5, PhD completed, leaver)

Did moving improve the access to information for research? Five of the researchers answered that it did. A strong association with information access is represented by databases:

“When I was leaving China, UK has a comparably better database system. They purchased a lot academic databases. So, it is relatively easy to find journals or the articles you need.” (P16, PhD completed, returnee)

“[...] probably it changed along with the whole industry, but as you probably know there is major issue with retrieving articles. And retrieving data or publications that have been done...the universities have to buy this packages of journals and...so you can have access to them. You really have to be lucky and that your university has grants to access that.” (P5, PhD completed, leaver)

The four researchers, who answered with no, had two main reasons. For two participants, who moved from Netherland to Denmark and from the United Kingdom to the United States, nothing changed. For P14 and P11 who moved from the United States to Ireland the access to information declined:

“Yes, accessing information is more limited. There are a lot of journals that I used to read...had access to when I was back in [university name deleted] now I have not.” (P14, PhD completed, leaver)

“Our library resources are much poorer here then at the university that I came from.” (P11, PhD completed, leaver)

Three researchers who said their information access improved with moving were also in English speaking countries (United Kingdom (2); United States (1)). The other two, who completed their PhD in Sweden, moved there from Ruanda and Thailand. P13, who completed her master's and PhD degree in the United Kingdom, assumed:

“Also, just because it is a bigger country and the language is English. Which means you do have not only British material, but American material, Australian material, Canadian material and there is something about that English language access privilege. How can you call it...you just do not really have...in Denmark or in Germany for that matter. I had access to that in the UK and that is...it is something extra. But I do sometimes feel that...British people and American people do not really realize it.” (P13, PhD completed, returnee)

For four participants, this question could not be answered since they studied another field with no comparable research methods in their home country.

The author asked participants if the studying in a foreign country or working there changed their research habits. For preparation, the participants first had to describe their research habits: teaching, having conversations with people close to them, in meeting with colleagues or conferences with other researchers. For two scholars, research methods and theories were also

part of their research habits. One researcher said she learned most of the methods during her master's degree. P11 brought a relatively new research field to Europe. As there are only few people doing this research in her country of residence, she brought most of her methods with her and still has a big part of her network in the United States.

In reaction to how they think moving changed their research, only two participants clearly said they would not have learned the research methods they are using without studying abroad.

Two researchers could not have studied at all in their research field without leaving their country. P2 could not say what his research would look like if he stayed in his home country. His research was clearly shaped by working in Denmark where he was doing research about the present infrastructure. However, in his opinion information science is largely international and unattached from locations. Two other participants concur that changes in research are not influenced by where you do the research but with whom you are working. So, the outcome of their own research is a series of decisions:

“So, then you end up on a certain research path, right? That is the result of all the proceedings steps. So, in a way, yes, because I went to Denmark that influenced what I am doing now. But I am pretty sure if went somewhere else I would have been influenced in a different way. And that path would not have been worse or better.” (P4, PhD completed, leaver)

5.6.3 Disadvantages and advantages of mobility on doing research

One part of the interview dealt with disadvantages and advantages for the participants when it comes to doing their daily research. Which differences they noticed between doing research in various countries?

The researchers indicate as advantages of their resident country: higher travel funding, good collaboration partners, networking with new researchers or stimulation by a different culture. For P11, moving to her country of residence made it easier to collect data for her research:

“Because I do qualitative research on various kinds of data practices, I find it very easy to contact people. It does not take more than a phone call or an e-mail or two to find a person you need. Because it is so small. So, I think that is an advantage. [pause] And the same thing is true...Ireland provides an interesting laboratory in some ways for the kinds of research I do.” (P11, PhD completed, leaver)

For two *returnees*, the time abroad was a stepping stone for the career and widened the perspective on research. A *stayer* said staying in her home country was a good option for her

dissertation because she wrote about the Danish systems and could conduct her interviews in the native language of the participants. However, she saw a disadvantage for her research in staying too, as it could give a one-sided view.

For P13, the hardest part of moving was coming home again:

“[...] it is a lot of hard work trying to get in somewhere again. Because it is the network...the network it is so important...in trying to make a career. And because the network in Denmark it is very insular and I was not really a part of that coming back from the UK. I had to build a new network and that has been hard. But I have built it up. I do not feel it so much anymore. It has been a very hard process building up a network.” (P13, PhD completed, returnee)

5.7 Discussion

Table 10 summarizes the individual push and pull factors of the interview partners and their ideas of reasons for students to do so. Due to the low participation from stayers this group could not be as thoroughly analyzed as planned. However, for the two *stayers* family was the reason they remained in their home country. The same way interview partners feel about family and friends as a reason for students to move. Children are a reason to settle at one place, while the partner may be a reason to leave the home country. Family, like parents or parents-in-law, are a reason to return to a country. Only one participant moved with her whole family to a new country.

Moving for a partner includes searching for a new job. Job offers are an important financial as well as educational factor for researchers. For students, these factors are linked. All participating doctoral students were already funded, two of them through a cooperation program between Sweden and a university outside of Europe. They received training they can use at their home country. The third doctoral student left his home country because of boredom, even though he already had a well-paying job there. In his case the personal factor and need for change were stronger than financial security.

The author did not speak with undergraduate students about financial pull factors for students. Therefore, professors had to answer for them about possible financial barriers. In their answers a concern in Europe about short time mobility became visible. Students tied to the financial support from their home countries often decide against studying abroad, for fear of losing this support. For degree mobility, this barrier plays no role. The same applies to curriculum barriers. Degree mobility cannot be subject to temporal obstruction or be questioned for its usefulness. The professors referred clearly to study exchanges happening within programs like ERASMUS. A curriculum barrier that both kinds of mobility have is the recognition of the degrees. In this aspect, the educational system in the United States seems to be more open, since no European researchers reported about problems resuming their studies in the United States, even if she or he had obtained a bachelor's degree in a different research field. Meanwhile researchers moving within Europe had this problem.

In terms of language, this form of mobility puts different expectations on students. Study exchanges can improve language skills. Decent knowledge of a foreign language is helpful but not necessary. Completing a whole degree in an unknown language is more complicated as a doctoral student explained in the interview. Researchers' language skills can restrict their job horizon. In academic institutions where teaching is part of the job, knowing the national

language is important, but more and more universities are deciding to offer study programs in English where it helps to hire international staff and attract international students.

Similar to researchers leaving a country because the labor market does not offer positions, a big push factor for students is when the educational system does not offer the degree program they want. Going to another country is the only possibility then.

| | Push factors | Pull factors | Push factors for students | Pull factors for students |
|-------------------|---|--|--|--|
| financial | job search (of partner), cost of residence permission | | funding of PhD degree | loosing financial support from home country |
| curriculum | job search, better employee contract | difficulties of a fresh start (building new network) | lack of education possibility, good for CV, learning possibility, training | temporal obstruction, question of usefulness, problems with recognition of qualification |
| personal | partnership, homesickness, feeling foreign, boredom | children, family | curiosity | family and friends |
| language | decent language skills | no decent foreign language skills | improving language skills | no decent foreign language skills |

Tab. 9 Push and pull factors of interview partners.

Of 16 participants, two never left their home country because of their family. Seven left because of curriculum reasons. Three returned for personal reasons to their home country. And seven left because of personal reasons. One of them left again after some years for curriculum reasons. The relation between migration and mobility becomes obvious in the interviews. While speaking with scholars about their intentions it becomes clear that *degree mobility* may provide migration, but in all cases in this study the scholars, with no personal ties to the host country, intend to move or moved back to their home country after completing their education. *Post-diploma mobility* more often provides migration when scholars move because of a new job and then settle down because of family reasons.

CV studies are common, but are not the best solution to identify genuine mobility. As the interviews showed, not all participants left their home country with the intention to study in another country, but moved firstly for personal reasons. Since the goal of the study was not to measure genuine mobility, this is no problem. However, the assumption from the quantitative data, that most individuals left their home country to get educated somewhere else, is wrong.

As for the information behavior results, most participants did not inform themselves about the institution they went to. The participants, who did inform themselves, wanted either to study at a specific institution or they applied for a job. The need for information about a new environment rises with having a choice or a specific intention. Participants, who had not informed themselves, already had personal contact to the institution or had no real choice.

The participants are working with various research topics. They came into contact through a mix of personal connections, previous research and influences from outside. The theoretical and methodological training for their research topics came from study, from cooperation with other researchers, or from self-training.

Whether a researcher's access to information improved depended on previous conditions. The participants often associated information access with access to digital information through their institutions. If the access to information declined, the researchers had moved from an environment with better access. In this study this is true for participants who moved from North America to Ireland. If the information access improved, the researchers had moved from a country with worse access to information. This applies to participants who moved from Asia and Africa to Europe, and within Europe to researchers who moved to Denmark or the United Kingdom. For information access, the researchers did not see the country as a decisive factor, but the institution, whose size and financial background mattered. In a country, different institutions can have different access to digital information. So, national mobility influences information access too.

Topics in information science can be tied to a national country. For those topics, being internationally mobile has less importance. In these cases, it is even better to know a system well and to observe it locally. Knowing the national language properly simplifies getting in contact or interviewing people. Depending on the research topic, moving can involve advantages for data gathering, networking or training. The participants of this study have experienced negative effects on their research primary through outside circumstances. Participation in international research *"is often not a reflection of personal achievement or failure, but can be determined by structural factors beyond an individual's control"* (Brooks/Waters, 2011, p. 16). Structural factors are the main topic in the next chapter.

6 Characteristics of a research environment

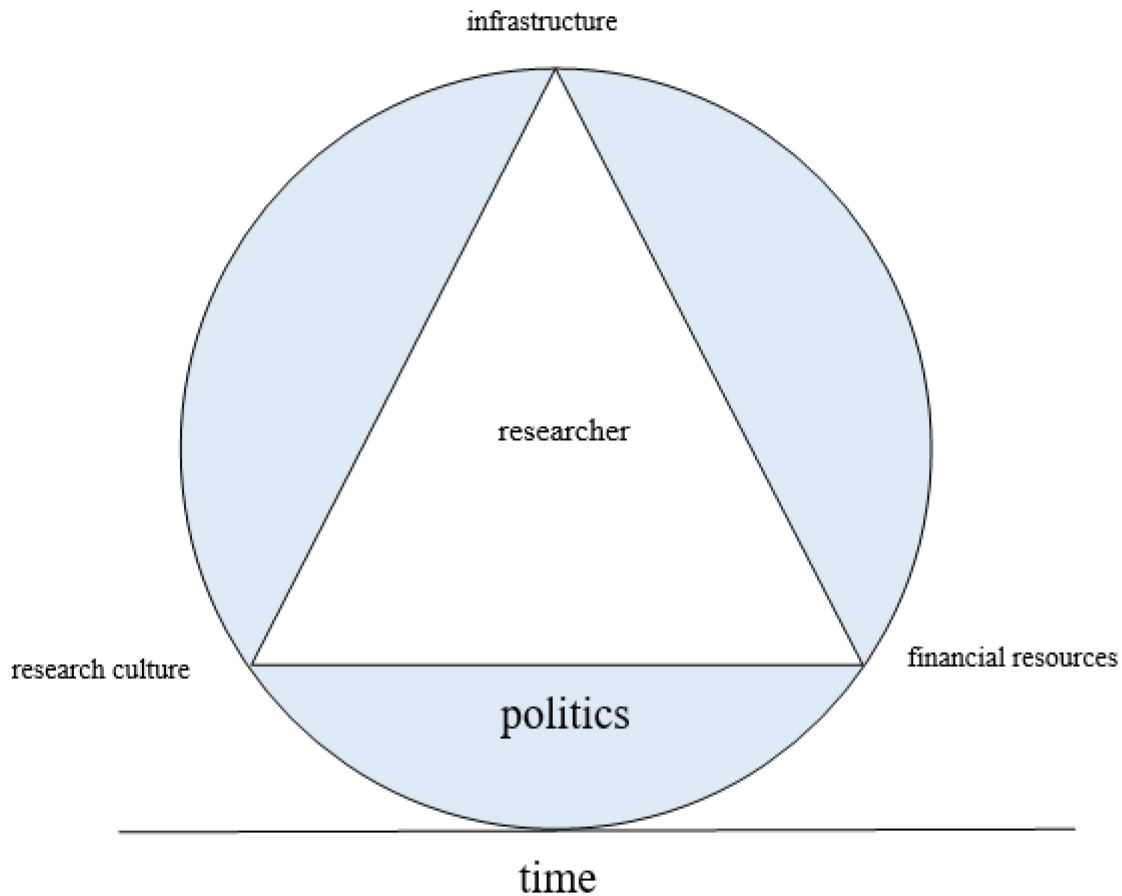


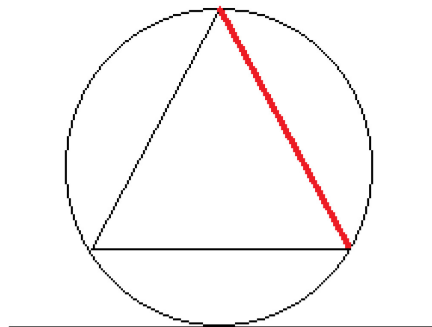
Fig. 18 Characteristics of a research environment.

During the interviews the author noticed the participants described their research environment as they tried to answer questions about their own information behavior. Out of this information the model (Fig. 18) of characteristics of a research environment emerged. The fundamental idea of the design is to show a researcher is surrounded by three influences in his research environment: financial resources, infrastructure and research culture. These three areas are encircled by the politics of a country, which, as the financier of public research environments, influences all these areas indirectly. The wheel is rolling on a time line to represent the constant movement and changing research environment.

In the literature, the nation state plays a key role in internationalization. In Europe, the merging of many countries into the European Union had a transnational political effect, with the power to create attractive research conditions. According to the literature, attractive research conditions include financial qualities: *“economic incentives, such as opportunities for better*

pay and career advancement and access to better research funding“ (OECD, 2008, p. 24). “Well-funded research infrastructure allows universities to deploy their best performing faculty so as to concentrate areas of strength, and to secure intellectual leadership at both national and global levels” (Marginson, 2006, p. 5). Research culture related factors include: “career advancement, higher quality research facilities, work with ‘star scientists’ or in prestigious institutions (and access to the associated social networks). Or institutional factors: more transparent systems of recruitment and reward, increased autonomy, freedom to debate and higher quality research infrastructure” (OECD, 2008, p. 150). The OECD report concludes this evaluation with the references that the relevance attached to these diverse considerations varies among individuals, between genders and over the course of the career path, as personal and family priorities change.

6.1 Infrastructure and financial resources



Universities, research libraries and research facilities that support researchers with different services are considered as infrastructure. Libraries need financial resources to provide access to information. In particular, licensing electronic information:

“[...] In terms of access generally all academic institutions all over the world they work in the same way. They all try to get access to electronic information as much as possible. So, you can access all the journals from everywhere.” (P8, PhD student, leaver)

However, not all universities have the same access to information. This difference is noticed especially when it comes to access to databases. Most researchers are aware that the differences are greater between institutions than between countries.

“And for example, the IEEE database that I sometimes need for my research is not available for my institution but was available through [university name deleted]. It is a just a larger, richer university.” (P6, PhD completed, leaver)

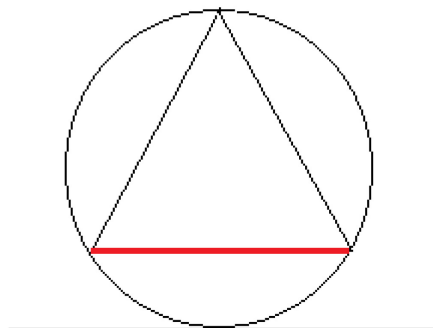
P6 did not move to another continent but to another state within the United States. Two researchers mentioned the same problem about their previous universities, both in the United States. For P6, not having access to databases stands for not knowing what happens in international research.

Two participants were more pleased with the library system of their home country than with the one they knew from studying abroad.

When the university in her home country did not have enough money for a master’s program, P9 decided to complete her master’s degree through distance learning.

A research environment should have the financial resources to do two things: recruit enough scholars to run the institution and to provide access to information, particularly in electronic form.

6.2 Financial resources and research culture



A research culture defines how and with what the research gets done. It needs a specific cultural framework in which it can evolve. In the literature, this framework often consists of research fields (Barner/Holosko, 2015 and 2016) or countries (Jacobs/Berg, 2013; Kizza, 2011). Allen et al. (2016) investigated research culture in relation to gender based on the citation impact of women in the top 25-ranked social work schools in the United States. In the second part of their analysis, they describe the elements of research cultures, which are essential to a profession’s academic development. Two of them are: resources available both within the school and the university to promote continuing research and scholarship, and opportunities for collaboration

with senior faculties with international reputations (Allen et al., 2016, p. 727). Or as a doctoral student expressed it, based on experiences in her host country:

“Sweden has a research culture which is very developed. ‘Cause maybe mostly funding is available, they have professors, they have researchers all experienced. But of course, in Ruanda we also developing research culture. But is still is not as developed as this here in Sweden.” (P9, PhD student, leaver)

Financial resources and experienced researchers are closely linked. Which factors make up an experienced scholar can be discussed. However, studies say that publishing and productivity are factors for judging the experienced researcher (Fennewald, 2008; Okonedo, 2015). Interviewees mentioned travel funding or research project funding as financial factors. Two participants living in Denmark experienced increased travel funding when they moved there. Two researchers living now in Europe found that funding their ongoing research had worsened. P11 described finding funding for her research as *“much more frustrating”* than it was back in the United States.

Besides financial problems with recruiting experienced staff and buying access to databases, research culture is influenced by its social framework. P6 knows the research culture of her home country well, since she taught librarians there. She describes the research culture as very different, and not international because of a lack of language skills and access to information. The way of doing research and teaching was different too. For her, the research culture needs more incentives for researchers to improve the situation.

“So, that is...you know...that kind of pertains to the culture. So, when I say culture it is like, yeah, it is a big thing comprised of specific components [...]” (P6, PhD completed, leaver)

Returning researchers and students are an important political priority to prevent a so-called *brain drain*. An OECD report from 2008 cites a strategy document from the United Kingdom: *“Returning researchers build scientific capacity in their ‘home’ institutions and countries through the application of the knowledge and skills acquired overseas”* (Global Science and Innovation Forum, 2006, p. 22). P9 and P12 participated in a fully funded PhD program in cooperation with Sweden. Both say they want to return to their home country to work with the knowledge they will get from studying in Sweden.

One researcher who returned home referred to a changing research culture in his home country because of him and his associates returning from the West. He returned for personal reasons. Another participant left his home country with the aim of getting a foreign education and then returning to his home country. He wanted the experience but never wanted to live there. The negative differences between research cultures are more striking:

“If you are at a good institution in the US, it should make no difference. If you have a department with a very strong research culture it should not make any differences. If you go from a department with a very strong research culture to one where there is a weaker research culture and the pressure of publishing is not as great. The tendency is to end up with people who are not very well equipped to support your research.” (P8, PhD student, leaver)

Two researchers have the impression their own research is not understood by the research environment in their host country. Having a bigger network in the home country is a consequence.

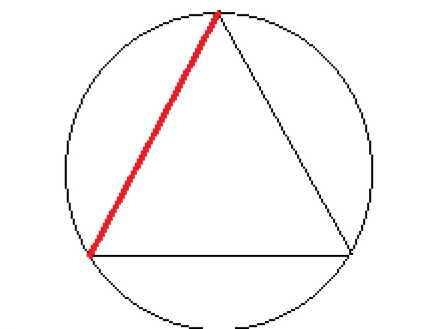
“It is still my biggest network even though I do not work there now. But most of my colleagues...if I publish something...they would still, mostly in America, understand my papers.” (P14, PhD completed, leaver)

Yet both have no plans to move elsewhere.

The OECD considers various reasons for students and researchers to return to their home country. To support a *“brain circulation, the home country needs to have sufficient absorptive capacity, and returning talents need to be able to re-enter local labor markets at a level that is appropriate for their skills and knowledge”* (OECD, 2008, S. 11). In addition, *returnees* consider their adjustment to the host country and the strength of family ties (OECD, 2008, p. 95). Most of the interview partners are leavers. They can still return to their home countries and if they do so they will take skills and knowledge back with them:

“You will take stuff with you and take the good stuff...and say, ok I would like to try this but I also like these aspects of it.” (P4, PhD completed, leaver)

6.3 Research culture and infrastructure



Infrastructures can directly contribute to the development of a research culture. Universities or research institutions and associated service providers make decisions that influence the research environment. Recruiting academic staff is one task with a high influence possibility on the research environment. Who is fitting in a department and which skills the scholar needs to have to fill a position depends on factors the leadership must decide on. P11 had the feeling that most European iSchools preferred their own nationality when hiring. P5 assumes language skills can be a strong disadvantage for applications. The university as a public entity must justify the money they spent on researchers to the public. It can be expected that a professor will have contact with the press, and give interviews or present himself or herself. This is a lot easier if a person speaks the native language properly. Another reason for having decent language skills, especially for academic staff, is teaching:

“I know actually that in terms when I only do research and not teach it is possible for me to stay in a not-English-speaking country. But if teaching is part of the responsibilities than I will need to go to an English-speaking country.” (P14, PhD completed, leaver)

Research depends on communication between researchers. Research cultures subsist on communication between institutions, within a country or on an international level. A basic condition for communication is linguistic comprehension. Without a common language, research cultures cannot interact. This circumstance gives an edge to widespread languages and can create research culture silos. Without proper language skills, some research cultures are excluded from others. A participant working in the United States also teaches in her European home country. For her, it is crucial that decent English skills are equally important for Ukrainian researchers and students:

“[They] do not publish in international journals. Part of the reason is language. So, a couple of professionals who actually know the language, actually enjoy participation in exchange programs. [...] They participated in some exchanges programs. On the international level. But people who had in my opinion the most potential often times they did not have the language. Which would be English in many instances.” (P6, PhD completed, leaver)

P11 presumes the high number of international students in English-speaking countries is due to the fact that English is more universal than other languages and publishing and researching without it is extremely hard.

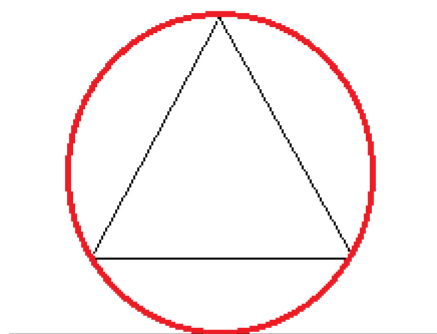
P14 describes how a different system for tenure and promotions can influence research productivity. In Europe, she has a permanent position and the pressure to publish is not as high as back in the United States. It gives her the possibility to do her research more slowly and with more freedom.

In an infrastructure where people work together on research, it can be the own supervisors with their opinions and decisions who influence the research culture. A participant told the author how the discouraging position of her boss towards her research made it harder to work.

Research institutions can shape the perception about themselves in the public. They do it in different ways through the politics, economy and society of the country they are part of:

“[...] but again, it is lack of understanding and naivety about the role of a research library.” (P11, PhD completed, leaver)

6.4 Influences of politics and economic on the research environment



One day before the author started with the qualitative data collection, Donald Trump was elected as the next president of the United States. A participant living in the United States commented on this political change and the influence on herself:

“And it was not really easy and here...now that Trump has been elected as president. I think that a lot of people are worried...I think that immigrants are worried, people of different sexual orientation are worried and I think a lot of people are worried about their future and what it means. I am worried as well. I have thought of maybe applying for a job in some other country, maybe back in Europe, maybe in Serbia, maybe in Canada, maybe even somewhere else.” (P10, PhD completed, leaver)

In June 2016, after a referendum, Great Britain left the European Union. P5, who recently moved to the United Kingdom for a position, is worried:

“If in the future, we going to change it depends on a number of things. It depends on the politics. Because the Brexit might make us uncomfortable. It depends on many things!” (P5, PhD completed, leaver)

Political events affect the researcher's personal environment via the infrastructure, the financial resources and the research culture of a country. Shortly after the inauguration of Donald Trump in January, newspapers reported about planned cuts for research funds (Savransky, 2017; Sopan, 2017). The position the government takes towards research influences the research environment. P11 describes the political agenda in her host country as more government-driven as in her home country:

“I think the Irish government's idea about research is you do research to make money for the university or create jobs. That is the government's attitude. So, if you're not

doing those you almost feel like what is the point of doing research.” (P11, PhD completed, leaver)

Governments decide whether foreign degrees may be accepted or not and which requirements are necessary for visa applications. These criteria can change after elections, or after decisive events like the September 11 attacks. In their book about international student mobility in the Asia Pacific region Kell and Vogl (2012) dedicated a chapter to the impact of terrorism, criticisms of multiculturalism and regressive reactions to global student mobility.

The OECD report noticed that *“there is generally more support for inflows of researchers and other HRST [Human Resources in Science & Technology] than for outflows, perhaps indicating that outward mobility is adequate or that countries are reluctant to encourage outward mobility, despite arguments about the benefits of brain circulation”* (OECD, 2008, p. 143). An exception is China. Due to measures taken by the Chinese government in the wake of system reforms, they encourage Chinese students to study abroad (OECD, 2008).

Economic growth is another reason to return to a country:

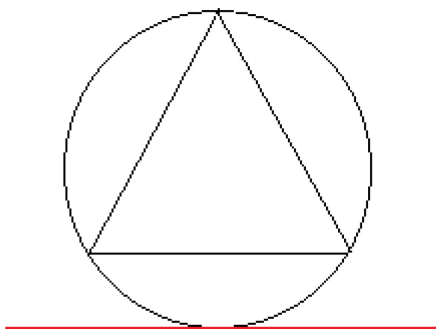
“I do have opportunity to find jobs in Europe. But at that time the European economy was going down. In 2011 and it was not particularly easy to find a job.” (P16, PhD completed, returnee)

At the same time the Chinese economy allowed its local universities to improve their information access through more financial support.

Ireland had a financial crisis in 2008, and according to P14 it has not yet recovered. However, returning to the home country is not the solution to this problem for P14:

“And I am also well aware that the kinds of financial problems we are facing everybody is facing. In just a different scale. I don’t expect the problems being resolved by moving back in the United States.” (P14, PhD completed, leaver)

6.5 The significance of time for research environment



“But it also depends on the time. I mean in that period during the 90s is kind of a special time.” (P10, PhD completed, leaver)

During the 90s and until the beginning of the 21st century, Yugoslavia fell apart in violence. Serbia, blamed as the aggressor, suffered under sanctions and the NATO started bombing the country. During this time, lots of people in the former Yugoslavian territory immigrated to foreign countries. War refugees cannot be a desirable part of mobility in higher education. However, it is reality. P10 left Serbia together with her family in 2001. They moved to the United States and are still living there.

“I think things have changed in Serbia during the past 20 years. And I think the whole education system has undergone certain transformations. It is just, I think, that things are probably still different.” (P10, PhD completed, leaver)

In the past 20 years, other things changed globally. The technical revolution changed the way of doing research or studying abroad. One participant moved to study abroad in the 80s when the ways of distance communication were through phone, mail or fax. Another participant left his home country during the 90s and had his first personal computer for work in his host country.

With the technical infrastructure, access to the Internet revolutionized the access to information. Not in the same pace all over the world, but doing research without access to digital information is inconceivable today. P12 and P16 noticed the improvement of access to information as they returned to their home country:

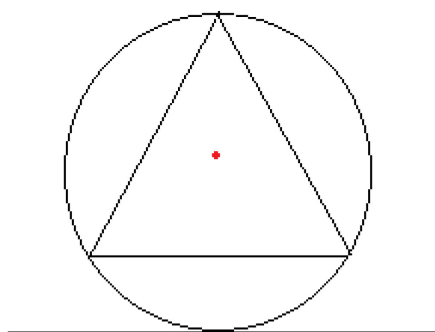
“I think learning in Thailand, in the past because I started my master’s degree long time ago, you do not have a kind of support databases. But right now, comparing with my

students who learned master degree program. We have some similar databases. We can access to databases all the world and is no problem about location.” (P12, PhD student, leaver)

Time is an unpredictable influence on the research environment, as it keeps changing circumstances:

“Well it is...it is always changing like everything else. Research changes because the contacts change because the society changes. Technology changes, the government changes as well. And the change in research becomes evident I think mostly because the government has actually a strong influence, same as in the West.” (P16, PhD completed, returnee)

6.6 The researcher



In the center of these interactions is the researcher. In a previous chapter the author described personal factors that are a strong push factors for mobility. People change through education, experiences or personal development. From the perspective of this model, individual factors cannot be included. The differences between individuals is too great. Still, such factors should be considered:

“So together with the country’s change and together with my growth as a researcher there is a technological transformation taking size and it would be unfair to consider one without the others.” (P5, PhD completed, leaver)

If personal factors have priority, they lead to an acceptance of negative cuts in the chosen research environment. Individual preferences can differ from the assumption that every researcher searches for the perfect research environment. A participant justified remaining in a

research environment clearly tougher in aspects of financial resources and recognition of her research than her old one:

“I think what I like about here is it is easy to be big fish in a small pond. So, I am a big fish in a small pond. I can...I know people. I can get stuff done.” (P11, PhD completed, leaver)

6.7 Discussion

*“While general migration has strong economic incentives, and often moves in conjunction with countries’ relative economic performance, HRST mobility has additional, and complex, aspects relating to **research opportunities, work conditions, and access to infrastructure**. These can be compelling reasons to move. Already as students, individuals may opt to study abroad in order to access quality training and facilities and to maximize their work opportunities after graduation” (OECD, 2008, p. 23).*

The description of an attractive research environment in the literature and the description given by the interview participants coincide. The research environment builds on three pillars: available infrastructure, financial resources and the research culture. Political and economic settings support these conditions. Research environments are subdued to rapid changes as politics, infrastructure and research culture are built on personal ties. Financial resources get distributed by members of those ties.

From a mobility perspective, a research environment can change completely or partially. When moving within a single country, most changes are possibly within the three pillars. Moving between countries changes the political and economic factors too. As P16 said, the immediate changes on national research happen through the government. P11 pointed out the differences between the government’s position towards research in the United States and Ireland. From her perspective, the research in Ireland is more government-driven and is mainly a source of financial income. For Ireland, financial income is possibly a priority after the financial crisis in 2008. The research environments at Irish universities are aware of the financial difficulties. These may be valid for more countries in Europe after the financial crisis of 2010 (Ritzen, 2016).

The financial crisis is an example of how economic circumstances can influence mobility. After completing his PhD, P16 had to decide where he wanted to work, and since the European economy was in bad shape, he chose to go home. A participant suggested that his home country, Spain, should invest more in universities if they wanted to retain more researchers in the country.

Another government concern is the right of residence. Within Western Europe, since the foundation of the European Union, this is no great problem. As the Brexit showed this can change suddenly, but whether it will change the mobility to and from the UK profoundly

remains to be seen (Marginson, 2017). Leaving Europe for the United States, as three European-born researchers did, could be getting harder as well after the election of a Republican president. As much as politics and economics influence the research environment, for a researcher the changes within the triangle in the diagram are more conspicuous. In terms of the relationship between infrastructure and financial resources, the participants noticed shifts in the access to information and support services in both negative and positive directions. It is striking that English-speaking countries play a significant role. The United Kingdom and the United States were mentioned positively, and Ireland negatively. As both researchers in Ireland moved from the United States, this may be due to their prior home country. Statements by interviewees about a change in information access depends on whether the previous conditions were poor and improved or the other way around. This is also true for a research culture. As P9 said, switching between two departments with a very strong research culture should not make any difference. Going from a department with a very strong research culture to one with a weaker research culture will have striking negative consequences for the research. Negative consequences include problems with research funding and a lack of understanding of their work. For a student, it might be the absence of experienced scholars and missing studying opportunities. For students, improvements in this sector could be achieved by moving for their education to another country. There is difference between mobility for education and mobility for jobs. With education, the decision to leave is tied to learning expectations. If a student's educational needs cannot be satisfied in one country, the probability of leaving is high. If their financial and personal situations are good, the probability is even higher. Researchers in the working environment need income to pursue their research agenda. They would rather live with negative consequences for their research environment than not work at all. For students, the first goal is to learn; for researchers, the first goal is to do research. Therefore, the weighting of advantages and disadvantages of a changing research environment are different between those groups. Improvements that those interviewed noted when changing to another research environment were more funding for travel and better employment chances.

An attractive research environment should have enough financial resources to do two things: recruit enough scholars to run the institution and provide access to information, particularly electronic information. The infrastructure should provide services to support research on one hand, and on the other it should influence the research culture positively by hiring qualified researchers and creating a supportive environment. A research culture identifies itself via good collaboration, access to a supportive network and experienced researchers. Cooperation between research cultures requires a common language. The English-speaking territories set

the tone in the international research due to their quantity and inflow. This is confirmed by the quantitative numbers and the statements of the interview partners. Doing international research without decent English-language skills in information science is not possible.

It is no coincidence that mobility is such a huge political topic. Governments are aware of the need to create a research environment that is as attractive as possible, not only to attract foreign researchers and students, but to retain their own researchers. *Brain drain* is nothing other than the outflow of scholars from a research environment seen as less attractive to a more attractive one. When governments improve the research environment, they do everything possible to encourage *brain circulation*. Finally, the decision for a researcher to leave may not rely only on research but more on personal factors. *Less amenable to potential government policy, but still important, are family or personal ties that draw talent to certain locations* (OECD, 2008, p. 10).

7 Conclusion

The author analyzed two types of mobility in this thesis: *degree* and *post-diploma mobility*. A first challenge in mobility research is the data collection and calculation of results. This dataset is based on the reviewers and authors out of three iConferences. Through manual online CV checking, three geographical stages of education and residence were collected. In the first part of the study the author analyzed the movement patterns of 882 active information scholars. The iConference is normally held in North America, therefore it is no surprise that 57% of the participants are from America. However, only a small number of Americans left their continent for education or employment and they generally move to English-speaking countries or back to America. It is quite different for Asians. Only a small number stayed in Asia. Particularly women turn their back to the home continent, departing to North America and not returning. All Asian PhD students from the dataset are currently studying in North America and whether they will return remains to be seen. Europe is the only continent with a high number of internal moves and the United Kingdom is the preferred destination. But if Europeans leave their continent, they go – like everybody else – to North America. English-speaking countries have a great impact on the international mobility of information science scholars, especially the United States. Abdullahi and Kajberg (2004) observed a stronger performance of North American iSchools in attracting international students compared to the European institutions. According to Marginson (2006) the mobility trend in information science does not seem to be different from the global trend in research mobility.

The qualitative part of this thesis involved push and pull factors for 16 information science scholars who were born in Europe or are resident in Europe. Four of them were doctoral students and one concluded her PhD degree recently. Due to the small sample the author can draw no general conclusion about why scholars stay or leave. Family is an important personal factor that influences staying or leaving, just as getting a job or a funded PhD position seems to be important for curricular and financial reasons.

Mobile scholars move to a new environment and take their previous experiences and skills with them. The awareness of changes in one's own skills, when it comes to information seeking in work-related matters, is low. Mostly the researchers described the changes in their environment instead. The access to information declined for scholars who moved from the United States to Europe. It improved when European scholars moved to the United Kingdom or Denmark, and when scholars from Asia and Africa moved to Europe. The scholars said that their peers have more influence on their own research than the country they are working in. For many, talking

with other people about their research is a popular way to start one's own research. The awareness of other routines, habits or changes through mobility in doing research was not apparent. However, online interviews are not the best way to recall a work process. In this part, the study could not exploit its full potential. For some research topics mobility is not required, either because the topics are national and could be observed locally, or the working materials are easy to access no matter where the researcher is. Through the digitalization of knowledge, the second scenario largely depends on the access given by an institution. As mentioned before, the access to information was an important factor for the participants. The author created a model of the environment providing this access to information and others factors out of the interviews. Infrastructure, research culture and financial resources are the three parameters influencing the researchers work directly. This triangle is shaped by the political and economic conditions of a country. Over time, such conditions can change and imply consequences for the lower levels of the model (see chapter 6). Both Asian-born participants confirmed that while they studied abroad, the access to information in their home countries became better because of an economic boom. If this model is used, it can point out weak spots in a research environment. Comparing the research environment in the United States and in Europe, the author observes some differences in the financial resources. These differences arise from a differential funding for education and research infrastructure: The United States has a large private education sector. In Europe, the United Kingdom is an exception with a mix between private and public funding of education. In Northern Europe, the educational systems are supported by strong public investments in research, which gives them a deep and broad research capacity (Marginson, 2006) compared to other European countries where education relies also on public funding. Money is a crucial factor for providing an attractive research environment and study programs. In a survey, most iSchools indicate a lack of financial resources as a reason for the low number of international enrolments (Abdullahi/Kajberg, 2004). But there are other factors in information science, persuading students to be mobile. English became the *lingua franca* in information science research through monographs and periodicals, thus it makes sense to teach students this language to prepare them better for research (Kell/Vogel, 2012; van Mol, 2014; Welch, 2008). While English scholars are not keen to go abroad, the English-speaking countries attract many European scholars because of the importance of the English language in scholarship (Morano-Foadi, 2005). This language hegemony creates difficulties for areas not using English as the language for education or research. First, they are not attractive for international students and second, their own students and researchers are disadvantaged in participating in international research (Altbach, 2015) and are therefore motivated to leave. The downside of the English

hegemony and the consequences for non-English-speaking areas are discussed in information science (Borgers/Greifeneder, 2016) and in public too (Hirstein, 2017). The Higher European Education Area is following this trend by introducing more and more international study programs in English. European iSchools are no exception (Abdullahi/Kajberg/Virkus, 2007; Kajberg, 2004).

Brain drain has too many negative connotations. It became a buzzword in economic and migration research to stir up the fear of losing elite researchers to competitors. However, if the *lingua franca* in information science remains English, and the English-speaking countries have a perceptibly more attractive research environment, students and scholar will move there. And their coming back cannot be controlled by imitating the North American Research Area. For that mobility and migration are too highly subjective. If the European Research Area offers multilingual information research in a smaller pond, it could be a strength. Especially with more support for the personal life of researchers and their families, and more funded PhD positions to tie students to the continent, as well as to attract the *bigger fishes* (back). The longer young people stay in a country, the more likely it is that they connect with the local research community and do not lose contact with it later. Through this contact, the loss of the researchers is not serious because the circulation of knowledge does not dry up that quickly, as the diaspora research shows.

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Appendix 1. Interview guide

Welcoming and thank you for the participation.

Permission for recording?

Request a short educational bio starting with university experience with year dates.

The further questions will depend on if the researcher is a *stayer*, *returnee* or a *leaver*.

Leavers:

Q1: Reasons for leaving?

Q1.1: Reasons for returning or for staying in the host country or going elsewhere?

Q2: How did the process of leaving take shape?

Q3: Would you say your access to information has improved?

Q3.1: Have you informed yourself with whom you could work together in your host country and influenced this information your decision to leave?

Q3.2: Could you tell me something about your research?

Q3.3: Would you say your research (topics, methods and habits) were influenced through experience studying somewhere else than your home country?

Stayers:

Q1: Reasons for staying?

Q1.1: If person wanted to leave, but could not: Questions from *leavers* can be used as well.

Q2: Could you tell me something about your research?

Q2.1: Would you say your research (topics, methods and habits) were influenced through your study? And if yes, when and how it influenced your research?

Thank you again und Goodbye!